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# Canadian Forestry Journal

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# BETTER APPARATUS FOR FOREST FIRE FIGHTING

## Some Results of the First Year's Experience with Portable Pump Under Practical Conditions

*By H. C. Johnson, Fire Inspector, Board of Railway Commissioners for Canada.*

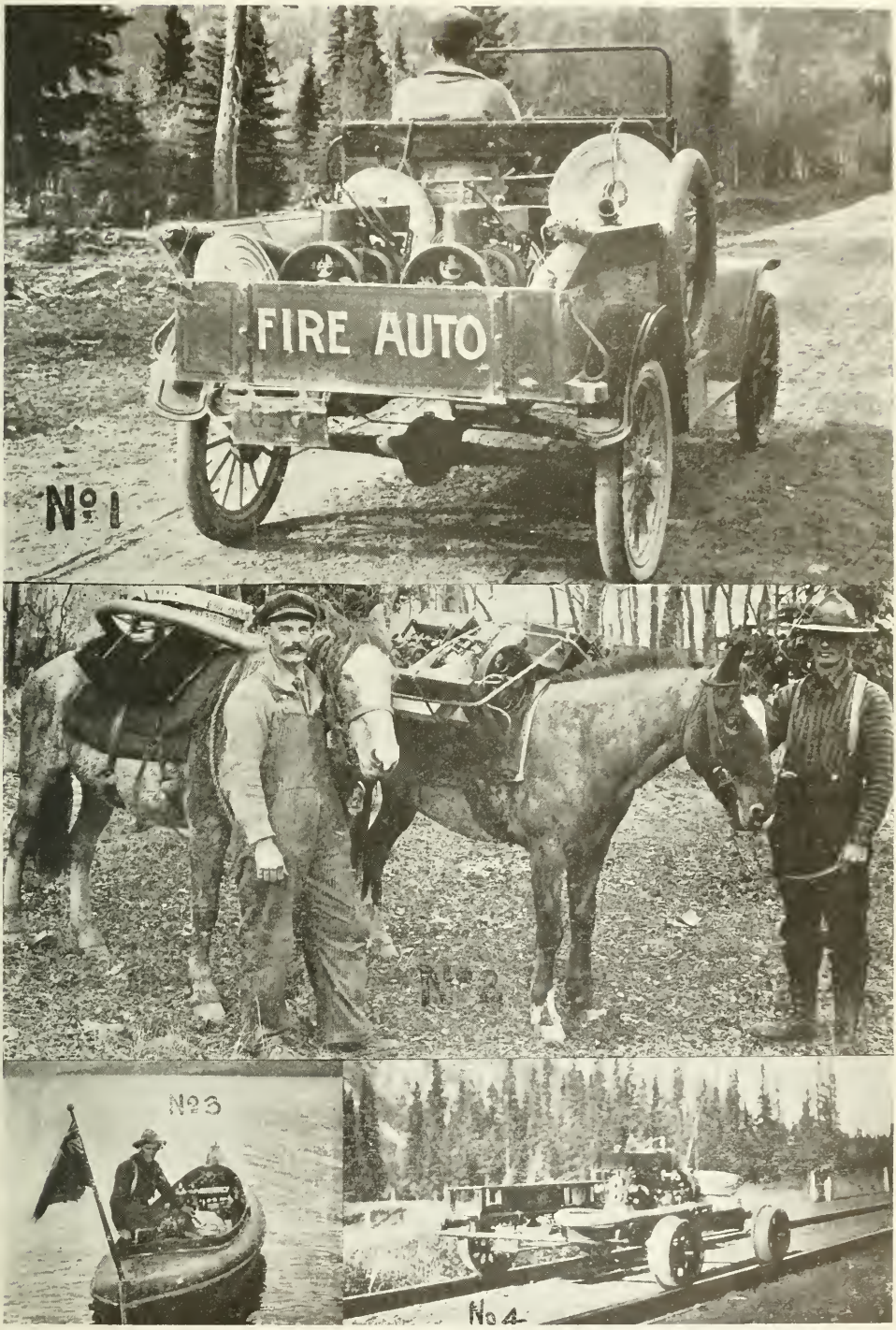
The writer endeavored in the January, 1916, issue of this journal to give a description and explain the proposed manner of using a system of portable gasoline pumping units designed by him and built for the Dominion Parks Branch for service in the Dominion Parks of Canada to be employed in forest fire fighting. These fire fighting units are also used for the controlling of certain operations carried on in the forest in which fire is used such as slash burning and back firing. Earlier theories in connection with the introduction of these units have now been put into practice and actual results have been obtained.

The first unit was built and put into service during the summer of 1915. It was used to control slash burning operations in the Rocky Mountains Park and proved very efficient in this work, enabling burning operations to be safely carried out in very dry weather and complete control of the whole situation maintained.

During the fire season of 1916 six units were put into service in the Dominion Parks, two units were put into service by the St. Maurice Forest Protective Association in the Province of Quebec and several units were also put into service in other parts of Canada and the United States. Many inquiries from all over the continent were received and, strangely, the majority of these came from private owners of forested lands, which would indicate that private owners of such property are wide awake to the possible destruction of their timber by fire and are anxious to provide up-to-date protection.

### *Put To The Test.*

One of the claims made for this type of power pumping apparatus was that it could be transported practically anywhere or to any point where a man or pack horse could go. During the past fire season this has been confirmed and put into practice by the Dominion Parks Branch in the Rocky Mountains Park and the St. Maurice Forest Protective Association in Quebec. The photographic illustrations shown here well illustrate the various methods used by the Dominion Parks Branch to transport these pumping units. View (1) shows several pumping units together with hose and auxiliary supply of gasoline being transported in a Ford truck along the main highway. View (2) shows two pack horses being used to transport two units, one horse carrying two engines and pumps and a second horse carrying the hose and auxiliary supply of gasoline. View (3) gives a good idea of the manner in which power canoes can be utilized to move the outfits from point to point on lakes and rivers. View (4) shows how on railway lines track motor cars are used to carry the outfits to a point nearest the scene of a fire. View (5) shows the method of transporting the engine and pump by two men; slings from the stretcher handles pass over the men's shoulders which enable the men to let go of the handles, if necessary, when passing through rough country or climbing. These five views show




THE FIRE PUMP IN ACTUAL USE.

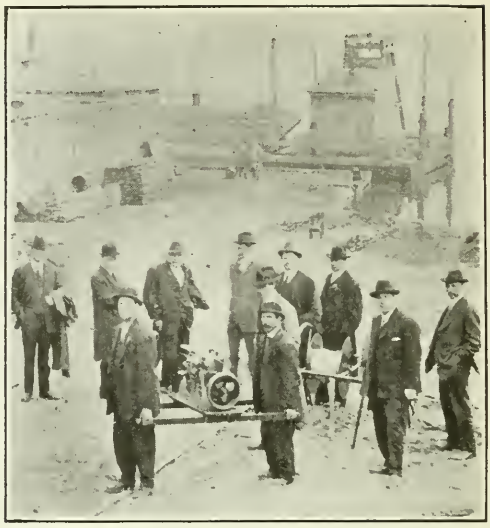
1. Automobile Transportation. 2. Two pumping outfits carried by two pack horses. 3. Readily transported in canoes, skiffs or launches. 4. Track motors are used to carry units along railway lines.

five different methods of transporting the units. In addition to these methods, a specially designed light truck on two wheels to be hauled either by hand or by horse, has been designed and built and a view of this truck appears in the January, 1916, issue of this Journal. Along roads where it is possible for horse drawn vehicles to go, such method of transportation can also be used.

*Fighting Fires in Quebec.*

Another theory advanced was that such apparatus could be used to actually fight a forest fire. This theory has been put into practice and judging from the following extract from a letter received from Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association proved very successful:

"During the past season we used the pumping outfit at four different forest fires and it has more than made up for its cost in the saving of fire-fighters' wages and timber saved. On two occasions we used the pump for three days, each time from 3 a.m. until 11 p.m. only stop-



**Method of carrying fire pump by two men.**

AT THE DISCHARGE END OF THE HOSE LINE

ping when changing it from place to place. We also used it to extinguish two other small fires.

"We generally transport the apparatus on our motor speeder to the point nearest the fire, then the rest of the route is covered by canoe or by men on foot along the portages. The pump was a grand success."

This particular type of apparatus and manner of employing same is a decided departure from anything that has been previously attempted, and so far as the writer is able to ascertain no forest organization in Canada or the United States have yet brought forward a portable pumping apparatus, that for portability, compactness and efficiency, can approach the apparatus under discussion.

The field in which the internal combustion engine can be utilized in connecting it up to pumping apparatus for use in the forest is very wide and in working out a scheme of forest fire protection in which such pumping apparatus is proposed to be used, is not limited by any means to the portable units under discussion. Larger outfits can be used, pumping more water per given time, at a greater pressure and through a longer length of hose line. Such outfits would be less portable and in consequence could only be used along the main routes of travel such as roads, railways, lakes and rivers. To secure this, a different type of pump and method of connecting same up to the engine will have to be adopted. This scheme is already under development and it is proposed to employ larger and heavier outfits along valley bottoms and by using three to four thousand feet of hose deliver water back into the higher territory and then use the present lighter and more portable units from that point on into the rougher ground behind.

### Fires on St. Maurice

In the territory of the St. Maurice Forest Protective Association in 1916, 200 fires for the season were caused as follows:

| | | |
|---|---|---|
| Settlers | 00 | |
| Railways | 77 | 38½% |
| Laborers | 28 | 14 % |
| Lightning | 17 | 8½% |
| Fishermen | 12 | 6 % |
| Unknown | 51 | 25½% |
| Berrypickers | 8 | 4 % |
| Jobbers | 2 | 1 % |
| Portagers | 1 | ½% |
| Explorers | 2 | 1 % |
| Trappers | 1 | ½% |
| Smudge | 1 | ¼% |
| | 200 Fires | |

The cost of extinguishing fires in 1914 was $13,004.32; in 1915, $7,329.47 and in 1916 $2,759.71, thereby showing progress made in patrol efficiency.

Pumping from a small creek in the Rocky Mountains Park.

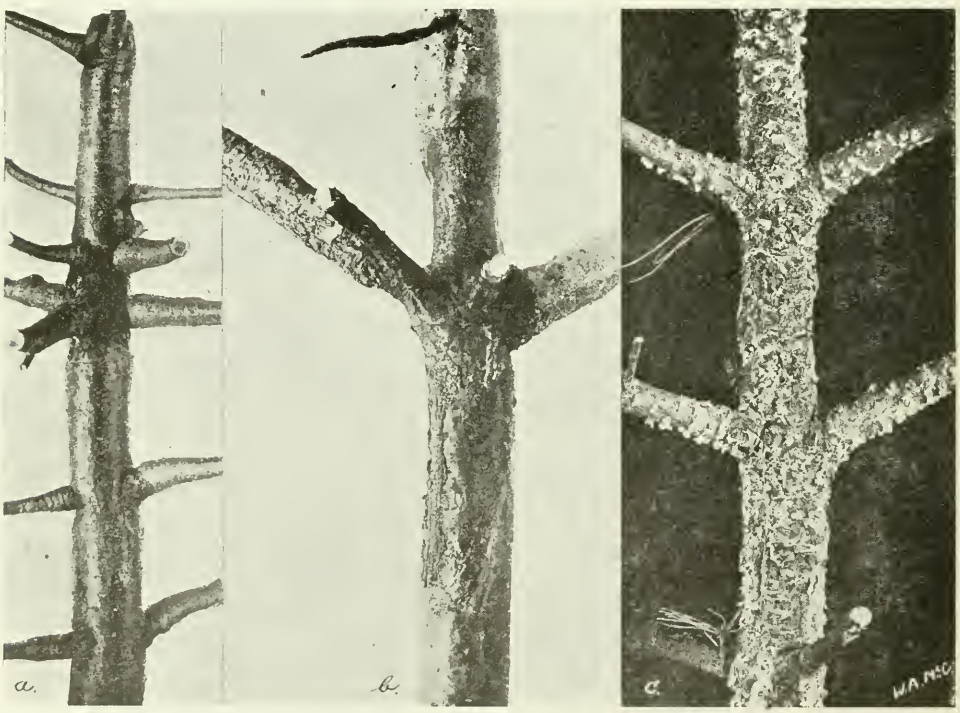
# CANADA'S WHITE PINE POSSESSIONS ARE THREATENED WITH EXTERMINATION

## An Authoritative Discussion of White Pine Blister Rust

*Written by H. T. Gussow, Dominion Botanist, Ottawa.*

The Forest resources of the Dominion of Canada, it has been said, are inexhaustible. This statement, on careful inquiry, may need some modification. The forest wealth of Canada undoubtedly is inexhaustible as far as the present generation is concerned it will be found ample yet for many more generations. We must however, bear in mind the wonderful opportunities Canada offers for settlement. With an increased population such as Canada requires to develop its natural resources to the fullest degree the demands on the Dominion forest resources will increase simultaneously, very probably in an increasing ratio.

We are, as a nation, so convinced of this great forest wealth that little




*White Pine Blister Rust* Photos by W. A. McCubbin

(a) Early stage of white pine blister rust showing typical swelling.
(b) Branch of white pine completely girdled by disease.
(c) Appearance of infected white pine during May and June.

thought is given by the general public that things may be different some day; and unless we carefully husband our resources, the time may come, when it will be realized that Canada's forest wealth is giving out.

*A word of warning* is intended to be sounded in this article,—a word of very earnest and serious warning. At the present moment, if one be asked which forest trees are the most important in Canada, one would unhesitatingly reply, the Pines—the White Pine proper and Western White Pine.

Are you aware that a white pine forest in Northern Europe is a thing of the past? The White Pine, from its original home in America was quickly introduced into Europe, because of its great commercial usefulness. But now there is no White Pine to speak of; it has been replaced by an inferior pine. Why? A fungous disease is to blame. It appeared, worked for years in silence, nobody suspected anything wrong, and then trees began dying here and there—slowly at first, rapidly later on. Then the eyes of the people were opened too late, far too late, the disease was so firmly established. Then the governments realized the position, and planted trees not subject to this disease. They fought the disease; but like a vast fire the epidemic was beyond control. They could do naught but look on. Steps were taken to study the disease; but it took years before the cause became known; and, before it could be fought, the white pines had succumbed. The Disease referred to was the *White Pine Blister Rust.*

## A DESTRUCTIVE PINE DISEASE IMPORTED FROM EUROPE

This disease was unknown in the continent of America; at any rate, if it did exist in early times, it cannot have been a virulent or destructive disease. When the white pine was introduced into Europe, the Blister Rust, which, before this time, must have been present somewhere,—some say in Eastern Europe or Serbia—found a very suitable host, and repaid hospitality by killing its host. There existed in European countries great tracts of land suitable for the raising of pine seedlings. Millions and millions were raised in Europe, few for their own use, but mainly for export, for export, curious as it may seem, to their native haunt the continent of America. Had one but lived years ago, and put a stop to this importation! Sure enough the disease came to America's shores with these seedlings. It doubtless arrived much earlier than its actual discovery, for it probably took years to become acclimatised—or, perhaps, it died out with the first pines it killed before spreading further. Who knows? Before the year 1914 the disease was, to all intents and purposes, unknown here. But in 1914, it appeared in one or two localities at first, was immediately recognized, and is since being persistently fought. Europe has returned America's generosity in the meanest way; the disease found its way from that continent into America, and now threatens our own White Pine forests.

## THE PINE BLISTER RUST REPRESENTS A SERIOUS FOE

Are we going to profit from the experiences of Europe? *We must!* This is the only answer possible. We must protect this most important lumber tree in our country. It is not those alone will suffer, whose interests are in the lumber trade. Think of the thousands of homes depending directly upon the returns from such industry. True there are other trees; but the White Pine, is commercially, the most important tree, and, I shall

*White Pine Blister Rust*

1. Young pine seedling showing spore deposit at X of pine blister rust.
2. Branch of pine showing roughness of bark after girdling branch.
3. Currant leaf showing rust stage on lower side of surface of leaf.

say a word or two about its value. Think of the many industries indirectly dependent upon the pine lumber trade. Think of yourself, when one of the most important sources of revenue is lost,—what that would mean to you, to your children, to the coming generations.

Our forest resources are not inexhaustible. When that was said, nobody gave a thought to such a destructive enemy! The enemy is now within our borders—it has spread during a few years from Ontario, where it was first found in Canada, to Quebec. Its spread is alarming, but not beyond control, it is hoped. It has spread also in the United States widely, far more widely than in Canada, so far as is known.

We know the enemy, we know what it has done in other countries. We must do all we can to prevent the destruction of our white pine resources. Most of all, those who are holding white pine sections, should co-operate with the government in its battle against this dangerous foe. Combined effort alone may yet save the situation. Let there be slackness, slowness even, and the disease will defeat our efforts. Twenty years, perhaps fifty, perhaps ten,—who can tell how long it will take this plague to repeat what it accomplished before. Now is our day to do what must be done, and, if we succeed, coming generations, our own children and children's children will thank us for the deed.

## DESCRIPTION OF WHITE PINE BLISTER RUST

The first and most essential point is to know the disease. If everybody made it his business, when in the woods, every camper, every hunter, every Boy Scout, every lover of our beautiful forests, and, most of all, every forester and wood man, from lumber-jack to owner—to know, recognize, and immediately report, where the disease was observed, and, if in doubt he send a specimen to those who know it, then we may hope to cope with it before it is too late.

The disease is most of all dangerous to the young pine. When it attacks the main stem,—and as many as one hundred separate infections and more have been observed on one tree—and girdles it, which it is sure to do eventually, the tree dies. *During May and June each year*, this disease can be recognized by any one looking for the following symptoms even if he have no training; later on, only experts can determine it. All know the appearance of the fine smooth dark green bark of stem and branches of this white pine. But does everybody know the white pines from other pines? Of course he knows that the white pines have five needles or leaves in a cluster, while others have but two or three. To make sure of this, he need only cut or pull off a cluster of leaves where they are attached to the branch, and count that little cluster held together at the base by a small sheath—if there are five needles it is almost sure to be a white pine—and even if not, (this disease only attacks five-leaved pines) it should be reported nevertheless.

During May and June, rarely after the middle of June, the disease is most conspicuous on the pine. The formerly smooth dark green bark will be found swollen, puffed up, "blistered," and breaking through the bark will be seen small whitish-orange scale-like bodies of a dusty floury appearance, composed of the spores or seeds of the disease. There may be a few or many at each point of infection. Often times one can see these from a short distance. They may be on any young branch or on the older wood, but they disappear after June, and only the blister remains, though far less pronounced to the casual observer.

Where the scales had been are often small drops of resin, or gum in the popular phrase, though these are not always present,—(or may be present from other causes,)—since even mechanical injuries to the bark, such as squirrel bites, etc., will cause gumming. In time, this bark be-

comes rough and cracked, the disease slowly makes progress up and down, or around the limb or stem, and kills the branch, or the tree if it has girdled the stem; or the wounded area may give rise to another series of spores, but at no other time of the year except May or June, will the spores be seen. In old pines the disease may live for years; young pines will succumb as soon as the main stem has been girdled.

Thus far, the disease on the pines. The symptoms should be carefully borne in mind, and always looked for, when one is in the woods in May and June.

## ANOTHER STAGE OCCURS ON CURRANTS OR GOOSEBERRIES

The fungus, as was said, produced orange white dust—like a coloured flour. This dust, when viewed under a powerful microscope, is composed of thousands of minute grains, spores or, popularly, seeds of the fungus. These spores, like seeds of wheat or other plants, germinate in a similar way. But not in soil like the latter. They require living plant tissues to develop. These little organisms or plants, for they belong to the vegetable kingdom, are parasitic and live exclusively on living plant tissue, somewhat as the mistletoe in Europe grows upon and with its roots within the living apple tree or other tree. The spores produced by the white pine blister rust cannot germinate on the pine direct, but pass the next stage of their life history on another host plant. When they fall upon the leaves of wild or cultivated currants or gooseberries, particularly the cultivated black currant, they germinate and produce on the lower surface of these leaves minute little spore blisters, from one to a few hundred on one leaf. These blisters are filled with bright orange-red spores, as small as those on the pine; to the naked eye they appear to be merely a reddish dust, which is the early summer stage. This stage may appear on currants in the neighborhood of the pines from which the spores originally came, at any time from June throughout the rest of the season; though, later they produce a second kind of spores. The early summer spores spread the disease known in this stage as currant rust; from currant leaf to leaf, shrub to shrub, plantation to plantation, and thus infection may travel for miles in districts where either wild or cultivated host plants occur. These plants are not killed; premature defoliation may result, with consequences injurious to the cultivated plants, but the parasite does not kill the plant so essential to the continuation of its life cycle. Towards the end of the season the so-called late summer spores are produced. These occur on very short peg-like protuberances growing from the lower side of the leaves; and these later spores only germinate on white pines anywhere in the neighborhood. This occurs in fall, and it may take several seasons before a blister is produced on the pine, which will give rise to the pine rust stage and the spores already described. This is the life cycle, rounded off: From pine to currant—and back from currant to pine.

## LESSONS FROM THE LIFE HISTORY OF THE DISEASE

This mode of life has acquainted us with two very important features. Without currant or gooseberry bushes there can be no pine disease, that is absolutely certain. If there be no pines—then the currants cannot be affected. Please note this point very carefully! If we wish to keep the currants or gooseberries, the pine should be destroyed: if we prefer the pine—the former should be destroyed. When one or other is done, this disease has lost its sting. Can this be done? Would we recommend, for

instance, the destruction of pines to save the currants, or, vice versa, of the currants to save the pines? These would certainly be the most efficient means to arrest this disease. The next important lesson to be learned from the life history is the modes of spreading of the disease. It spreads of its own accord on currants or gooseberries, for miles in one season, in all directions; and eventually reaches a pine, a pine plantation, or a forest, and these then, in turn, may start new outbreaks. Hence the next lesson to be learned is this:—no currants or gooseberries near pines; no pines near gooseberries or currants.

How far apart should these different host plants grow from each other? This point is still an open question—but the farther apart the better. Can this be carried out? Sometimes a single pine, or a few pines menace the cultivated currants; sometimes a few shrubs of the latter, the former. Therefore, whichever, in a given locality, is the more important must remain, and the other be destroyed—certainly if affected, but better at any rate. Most important of all, all wild currants and gooseberries should be destroyed: they are most serious offenders. This should be done everywhere in or near valuable pine woods.

There is yet another danger, that currant rust spores may adhere on baskets of currants or other fruit, when shipped from an infected area, and spread the trouble very widely—that the disease will eventually find its way to a pine. So far as now believed, currant bushes in themselves and sold as such, do not appear to carry the disease, once the leaves are gone. Doubt still exists on this point, which we are now endeavouring to settle. Should the disease be conveyed by infected currant bushes, this would constitute a new menace, and the question become more difficult. However, it is generally held that infection of currants occurs every year afresh from nearby pines, strange as this may seem.

## THE DISEASE IS CARRIED ON PINE NURSERY STOCK

We know for certain that the pine carries the disease—it was by pine seedlings from Europe that the disease was introduced; hence importing pines into Canada should be stopped. This was done shortly after taking up my work in Canada. No pines (five-leaved) can enter Canada from anywhere abroad, reads an order-in-council.

## QUARANTINE AND CONTROL MEASURES NECESSARY

A federal quarantine against white pine seedlings or other five leaved pines, and, if possible, against currants, etc., from infected provinces or areas, or individual nurseries, is desirable. The first work to do is the accurate location of every infected locality—this requires men and time, the more men the shorter time. The shorter the time it takes to know accurately the distribution, the better the chance to fight this disease. Therefore, let all concerned come to the fore! The question is of greatest moment; and the experiences of other countries are on record. Shall we too fail, where others have also failed? It may become necessary, but not until the distribution in Canada of the disease is fully ascertained, to establish a safety belt of considerable breadth in which currants and pines shall be wholly eradicated, isolating, if possible, the infected area from valuable timber limits. Wherever diseased pines are located they should be immediately destroyed.

## PRESENT DISTRIBUTION OF DISEASE

During the early season of 1909 large shipments of foreign seedling pines were received in the Continent of America, part of which went to New York, New Jersey, New Hampshire, Pennsylvania, Connecticut, Vermont, Massachussets, Ohio and Indiana. But a portion of the same shipments was introduced into Canada. In all of these States, and also as far as Minnesota, the disease is now established, as well as in parts of Canada. It was first discovered in the year 1914, near Guelph, Ontario, and later in other parts of the Niagara Peninsula, mainly on currants, but, unfortunately, on native pines also. It is now distributed generally in Southern Ontario, but may not yet have reached the important white pine section, although no systematic search has been possible there. Quite recently the currant rust stage was found in Ottawa; as it was also this season in certain localities of Quebec province. Very urgent need exists for systematical inspection of all pine areas. In the west no inspection has yet been possible.

It is gratifying to note also that both the Ontario and Quebec governments have become deeply interested, and much work promises to be done next year. It would be a matter for congratulation if the government inspectors should be aided by the employees of lumber companies and other concerns interested.

## VALUE OF WHITE PINE LUMBER CUT IN 1915

In Bulletin 58A, published by the Forestry Branch, Department of the Interior, the white pine lumber, including both species, White Pine (*Pinus Strobus*) and Western white pine (*Pinus monticola*), is valued at $17,584,149 for 1915, or nearly three quarters of the value of the five commercial spruce species of Canada taken together.

It is to be hoped that the matter dealt with in this article will be fully discussed at a meeting in the near future, at which all interested parties may be represented. Co-operative effort alone will save the situation. Meanwhile, if, as a result of this article, attention and careful thought become focussed on its subject matter, something will have been accomplished.

In conclusion, I wish to anticipate the probable charge against me of crying out "wolf" causelessly, and of taking too alarming a view of the situation. Let me most emphatically re-iterate, I am an alarmist, and am so of set conviction in this matter. My attitude is based on the experience of other countries, with forest timber diseases, on the already rapid and insidious spread of this particular disease in America, and lastly, but not least, on the importance of rousing to action all concerned, while there is yet time. So surely as my warnings lie unheeded, will the ultimate loss of trade and revenue fall on all, whether or not interested financially now, in the White Pine Industry, one of the prime factors in our Dominion's vast resources.

H. T. GUSSOW,
Dominion Botanist.

*NOTE:—Foregoing article has been issued in pamphlet form by the Canadian Forestry Association, and widely distributed.*

YELLOW PINE CONES SPREAD TO DRY ON CANVAS SHEETS.

EXTRACTING YELLOW PINE SEED FROM THE CONES. (Photos by courtesy of United States Forest Service.)

# LARGE PART OF B.C. FOREST LANDS DEVOID OF TIMBER

## Heavy Inroads of Past Fires—Present Supply Ample However For Great Development

On November 23, Mr. Roland D. Craig addressed the Forestry Club, Ottawa, on the subject of the forests of British Columbia, which he treated from the physiographic and silvicultural standpoints.

The province of British Columbia is approximately 740 miles from north to south and averages 400 miles in width, with a total area of about 250,000,000 acres. Running from north to south ranges of mountains divide the province physiographically into four main zones, which differ widely in regard to climate and silvicultural conditions. The warm, moisture-laden winds off the waters of the Japan current, in ascending the Pacific slope of the Coast Range of mountains, produce an equable climate and cause a heavy precipitation which is conducive to luxuriant forest growth. To the eastward of the Coast range lie the broad interior plateaux where greater extremes of temperature and drier conditions prevail owing to the fact that the winds have been robbed of their moisture in passing over the coast mountains. On the eastern side of the province another series of ranges, the chief of which are the Rockies, again cause a large precipitation and another belt of heavy forests, resembling those on the coast, occur. The north eastern portion of the province, comprising approximately one-eighth of the total area, lies to the east of the Rockies and belongs to the Great Plains, on which the forests are of the same type as in northern Alberta and Saskatchewan. From north to south these main zones may be sub-divided following changes in climatic conditions due to differences in latitude and local topography.

### *Bulk of Timber on Coast*

Two-thirds of the total stand of the timber in the province is on the coast, though the area is only one-quarter of the total. In the coast region for 150 miles north of the International boundary, and including most of Vancouver Island, the forests are of the Douglas fir-cedar-hemlock type, with balsam, spruce, white pine and yellow cedar as secondary species. For the next 100 miles where the temperature is lower and the precipitation heavier, red cedar predominates, with fir occurring only at the heads of the fiords which indent the coast and where the precipitation is lower. Associated with the red cedar are hemlock, balsam, spruce and yellow cedar. On the northern coast the following species occur in order of predominance: hemlock, spruce, red cedar, balsam and yellow cedar. Though confined to a comparatively narrow range on the coast, Douglas fir forms over thirty percent of the stand with red cedar twenty-seven percent, hemlock twenty-four percent, balsam nine percent, spruce seven percent, yellow cedar two percent, white pine one-half percent, and lodgepole pine and cottonwood one-half percent.

In the Interior Plateau region drier conditions permit a much wider distribution of the Douglas fir which extends to the north of the Grand Trunk Pacific Railway and in the southern region western yellow pine and western larch are added to the forest species. Taking the interior forests as a whole, spruce forms over 40% with red cedar, balsam, fir, hemlock, lodgepole pine, yellow pine, larch, white pine and cottonwood in

order of predominance. The high percentage of spruce is due to its prevalence in the northern interior and plains region.

*60 Per Cent Waste Land*

Of the 250 million acres of land in British Columbia, a very large percentage of it, 60 percent, is estimated to be waste land from the standpoint of agriculture or forestry due either to its high altitude or to local site conditions. Of the area which is capable of producing forests, not over 8 percent. has any agricultural value. Unfortunately, the forests on a greater part of this forest land have been destroyed by fire, only 35 percent of the forest land carrying stands of commercial value at present. These forests reproduce well naturally, and if protected from fire will supply wood crops aggregating many times the present cut of one billion feet per annum. It is estimated that of the species suitable for the manuacture of pulp this province can supply 250 million cords.

# THE CHRISTMAS TREE TRADE

## Is Government Regulation of Cutting Spruce and Balsam for Decorative Purposes Practicable; the Children's Side

Every year the Canadian Forestry Journal is in receipt of many letters from readers protesting against the ruthless cutting of young spruce and balsam trees for purposes of Christmas decoration. The Association in the past has taken objection to the export of millions of these trees to United States purchasers explaining that the Canadian farmer, from whom they were taken, was paid only a few cents each and the country was often a substantial loser in having so much young growth destroyed.

It is beyond doubt that the cutting of Christmas trees becomes in some cases an act of vandalism as was recently reported from Hamilton where hundreds of young spruces from a semi-public park were cut down and peddled about the city.

That there is another side to the story is suggested by the following comments of Bristow Adams in "American Forestry," and readers of the Journal are invited to express an opinion as to how any Government regulation could lessen the waste of evergreens each year for these decorative uses, without clashing with an undoubtedly vigorous public sentiment ready to resist the elimination of the time-honored right to brighten Christmas day with a festive tree.

"Every year some one starts a crusade against the Christmas tree idea, and every year I wonder why they do not do the same thing against the Easter lily and the football-game chrysanthemum. In Michigan there is a nursery which grows Christmas trees as a regular annual crop; in New England the farmers cut hundreds of thousands out of their fields for the city boys and girls, some of whom rarely get in any closer touch with trees than they do in this holiday season. Every year the dairy farmers in the hill counties of New York welcome the chance to get rid of the spruces which work into their pastures and use up space that might be growing grass for the cows. The more our family has thought about the use of Christmas trees, the more we have been in favor of them.

"One person says, "let's all do without Christmas trees; or, if we must have them, let every one plant two trees for the one that is used on Christmas." Now that might be a good idea in some few places. But how about the many children who live in tenements in the crowded parts of the cities? Are they to go without this one glimpse of greenness, or attempt to make two trees grow in a paved court-yard? Even in the large and elegant apartment houses the mighty janitor could not provide

places for two trees for the children who live there. Oh, yes, there are some apartment houses that take children. I've seen 'em!

Then there are the children on the farm, where father has brought in the home tree from the back pasture, and has sent John down to the freight station, with forty bundles of trees on the big sled. He is glad to have that much more clearing done, and to have the work pay for itself. He wouldn't care, I am sure, to have a tree-planting band go out and put in two new ones.

Besides, there is all the trouble and expense of getting the two additional trees, and the very great risk that they will not live after they are planted would make possible a loss of three trees instead of one.

"The best way is to have just as much or as little Christmas tree as you wish, but not to try to make other folks do things your way. In many cases the merriness of the Christmas of the farm child depends on whether there is a good sale for the trees that the farmer hauls to train or town. In any case, could we get the opinion of the tree, it would probably echo what one said in our discussion: "If I were a tree I'd rather be used in making little children happy at Christmas than in any other way."

### The Christmas Tree Trade.

It is most unfortunate from a conservation standpoint that Christmas requires the use of tens and tens of thousands of spruce and other evergreen trees, observes the Pulp and Paper Magazine. These trees are cut down and shipped out by the car load; the annual export making very serious inroads on the future timber supply of the nation.

Among cattle men and farmers a movement has been started to put a stop to the killing of calves for veal. It is pointed out that the present very serious shortage in dairy and beef cattle is largely due to the pernicious habit of slaughtering young calves. If a calf is allowed to grow to maturity it plays a very much larger part in the economic life of the nation than if slaughtered shortly after birth.

In much the same way the cutting down of young spruce trees affects our supply of pulp wood. A man gets but a few cents for a Christmas tree yet it is probably cut from a hillside which is incapable of growing anything else but trees. The cutter never thinks of replacing the destroyed tree with a seedling and so the way is paved for the land to become a barren waste. If the tree is left to mature and then cut and used to make paper the return is much larger and with our growing appreciation of the value of reforestation the probabilities are that a seedling or two would be planted to take the place of the tree cut down.

From the standpoint of the papermen the Christmas tree trade is most hurtful and we would like to see the Pulp and Paper Association and the Commission of Conservation take some action in the matter.

Above all others the cry of "Woodman spare that tree" goes out to the man who cuts down and ships out car loads of young spruce trees.

### Canada As a Paper Maker.

Indications point to Canada as one of the most important pulp and paper producers of the world for many years. There is no reason, except apathy respecting fire-protection in the pulp producing regions, why Canada should not produce perpetually a large part of the world's paper. The large spruce forests in the east and north including the sub-arctic forest which has value chiefly for pulp, show Canada's capacity to grow suitable wood in enormous quantities, sufficient, with any kind of protection and management, to supply the demand of all time. Pulp forests are, however, particularly susceptible to fire, and need careful protection.

It is gratifying to see that some of the most progressive pulp companies are successfully protecting their lands from fire. On account of the comparatively rapid growth of pulp timber to a commercial size it appears that pulp companies will be the first who can prove that scientific forest management is good business for a private concern.

FUR TRADING CAMP ON THE NELSON RIVER, NORTHERN MANITOBA.

# Canada's Fur Crop Nearly $2,000,000

Recent reports of severe forest fires in the neighborhood of Hudson Bay and James Bay mention the serious effects upon the trapping and fur trading activities of the Indian population.

The last Dominion census gives the total value of Canada's fur crop in 1910 as $1,927,550. The item of greatest value in the table is that for "assorted furs", $445,320; muskrats, $256,213; martens, $221,583; and minks, $221,500. The largest production is naturally in the unorganized territories, the value being $500,217. The figures do not apply to production of fur farms or from wild animals in captivity.

### J. D. Gilmour Promoted.

John D. Gilmour, formerly with the Forest Branch of the Department of Lands of British Columbia, has resigned in order to accept the position of general logging superintendent of the Anglo-Newfoundland Development Company, Ltd., a branch of the Harmsworth Company, owners and operators of immense pulpwood holdings in Newfoundland. Mr. Gilmour will assume his new duties during January, and will be stationed at Grand Falls, Newfoundland. Mr. Gilmour is a 1908 graduate of the Ontario Agricultural College and also of the Department of Forestry in the University of Toronto. He has had experience in the employ of private lumber companies and also in the Forest Branch of the Canadian Pacific Railway and the Forest Branch of the Department of the Interior at Ottawa. Since 1912 he has been on the staff of the Forest Branch of the Department of Lands of British Columbia, being district forester at Cranbrook from 1912 to 1915 and on the head office staff at Victoria during the past year.

### B. C.'s Growing Pulp Industry.

The increasing production of pulp and paper in British Columbia continues, and it is announced that the plant of the Empire Pulp and Paper Mills, at Swanson Bay, 100 miles south of Prince Rupert, will be turning out chemical pulp in commercial quantities, the daily output when the plant is in full running order being between thirty-five and forty tons.

Steady expansion in the lumber industry along the line of the G.T.P. in British Columbia is noticeable, notably east of Fort George.

## *Free Cartoon Service of Canadian Forestry Assoc.*

Although the interests of the farm and the forest have been regarded in the past as more or less distinct and hostile, the broader outlook stimulated by the War has brought intelligent Canadians to understand the woodsman and the agriculturist as close partners in the great Canadian estate.

More than sixty per cent. of the whole area of Canada is adapted by Nature for growing timber or held as permanent barrens and will not produce field crops profitably. On this sixty per cent. no farmer desires an acre. At the same time it ought to be producing revenues for the nation. As much of it as possible should be kept under frest growth, producing wood crops regularly. This is the argument for "forest conservation" in a nutshell. No one asks to be allowed to use agricultural lands for tree growing. And no farmer will object if the country maintains non-agricultural lands in their natural money-making conditions, giving timber harvests year by year.

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The Forest Dollar, therefore, is not earned at the expense of agriculture, but is the ally and supporter of agriculture. Canada takes $200,000,000 a year from the forests and a very great part of this amount goes to purchase farm products. Until every destructive forest fire is stopped and every timber-growing area restored to its productive condition, Canada's agricultural interests must suffer the chief loss. Of every hundred dollars that come out of the forest, seventy-five dollars go for wages and supplies. The remaining twenty-five dollars pay interest on the lumbermen's investment and help make up the $7,500,000 taken by the provincial and federal governments each year in taxes.

Canadian Forestry Association,
Ottawa.

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### New B. C. Minister of Lands.

The Hon. Thomas Dufferin Pattullo, has been chosen as Minister of Lands in the new administration formed by the Hon. H. C. Brewster. Mr. Pattullo, represents the district of Prince Rupert in the provincial legislature, a section of the country containing considerable forest resources.

# B.C. PREMIER PLEDGED TO PLACE SERVICE ON MERIT BASIS

From the courageous action of the new British Columbia Government under Premier H. C. Brewster in definitely committing itself to an elimination of the patronage system in Civil Service appointments and other administrative undertakings, and the engagement of Dr. Adam Shortt of Ottawa to make recommendations toward such an end, there seems every likelihood that the Forest Service of British Columbia will receive substantial benefit.

In an effort to re-inforce the Premier's determination to remove the serious handicap of the patronage plan, the Canadian Forestry Association directed to him a letter which, with Mr. Brewster's reply, are given herewith :

Ottawa, Nov. 17th, 1916.

Hon. H. C. Brewster,
Victoria, B.C.

Dear Sir:—

We have followed with much interest and satisfaction the assurances given during your recent campaign favoring the elimination of the patronage principle in Civil Service appointments and the conduct of provincial affairs. To the adoption of such a principle by all Canadian Governments, the Canadian Forestry Association has devoted no inconsiderable part of its educational campaigns, and in successive conventions has pledged its support to the merit system of appointment and promotion.

In taking such a stand, the Association has been especially concerned for the welfare of the various forest services. It has been demonstrated beyond argument that the qualities of skill, energy and devotion, absolutely requisite in a genuine system of forest guarding, are at a severe discount where the 'patronage' plan of appointments is in control.

In Canada and the United States, extravagant and inefficient forest protection systems are to be found precisely where the patronage scheme has most freedom. In such instances the public pays heavy tolls not for prevention of timber losses but to keep party followers in well-paid idleness.

The Forest Service of British Columbia has built up the best record of any forest service in the Dominion. The reduction of fire losses has been a direct consequence of good organization, close inspection, and a competent personnel. What has been accomplished in four years is a forerunner of even better results in timber saving during the years ahead. We take it for granted that the new Government will not only regard the Forest Service as the foundation of the whole timber industry, but will see that its expansion coincides with the opportunities and responsibilities certain to develop.

A forest service takes its character from its executive head. Mr. H. R. MacMillan's work as Chief Forester of British Columbia was largely responsible for the creditable results obtained. The capability of Mr. MacMillan's successor in the office will determine whether the Forest Service will maintain its usefulness to the province or restore the old days of ill-management and heavy waste from forest fires. We are convinced that the next Chief Forester should be a man of high calibre, with administrative ability and that

he should be in substantial agreement with the policies of his predecessor. The British Columbia Forest Service is to-day on the right road, and any radically-altered direction would, we are convinced, end in misfortune.

Having regard to the great tasks awaiting the Forest Service of your Province, this Association feels confident that the Civil Service principle will be followed by you in selecting a new Chief Forester. We do not doubt that a worthy successor can be found within the present staff. It is our hope, equally, that your pledged adherence to the merit system in public appointments will lead to the development of a permanent Forest Service staff reasonably secure in their appointments and thereby incited to their best efforts.

Yours truly,
Canadian Forestry Association,
ROBSON BLACK, Secretary.

### HON. MR. BREWSTER'S REPLY

Victoria, B.C., Nov. 24, 1916.

Robson Black, Esq..
Sec., Canadian Forestry Association,
119 Booth Building, Ottawa.

Dear Sir:—

I have the honor to acknowledge receipt of your communication of Nov. 17th in which you deal at some length with the excellence of the Forest Laws of British Columbia, and the necessity of the careful and judicious administration of these by the appointment to official positions of men who know their work, and can command the respect and confidence of their subordinate officers.

I note also your intimation that efficient service could be secured best by the entire elimination of the patronage system in the Forest Service. It will be the intention of the new Government to abolish the evils of the patronage system, wherever these have been in evidence, and the Forestry Service will, in no sense, be an exception to this rule.

I thank you for the courtesy of your letter and can assure you that when a Chief Forester is selected the appointment of such an official will be upon merit, as far as the new Government is in a position to decide.

Yours truly,
Signed H. C. BREWSTER.

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## *Poor Trees in Woodlots*

Many woodlots contain a large number of inferior species, trees that have little or no commercial value such as hawthorne poplar, willow, juneberry, ironwood and blue beech. In cutting firewood these should first be removed. They are occupying space which might be better utilized in growing more desirable species. The removal of dead, decayed and over-mature trees is also advisable. Dead trees or dying trees are a source of danger to other trees. They harbour insects and develop rot producing fungi which spread to sound trees. —B. R. Morton, B. Sc. F.

BRUSH WELL PILED FOR BURNING. AN OPERATION SUPERVISED BY DOMINION FORESTRY BRANCH ON DOMINION LANDS IN ALBERTA.

# Ontario's Protective Plan Under Way

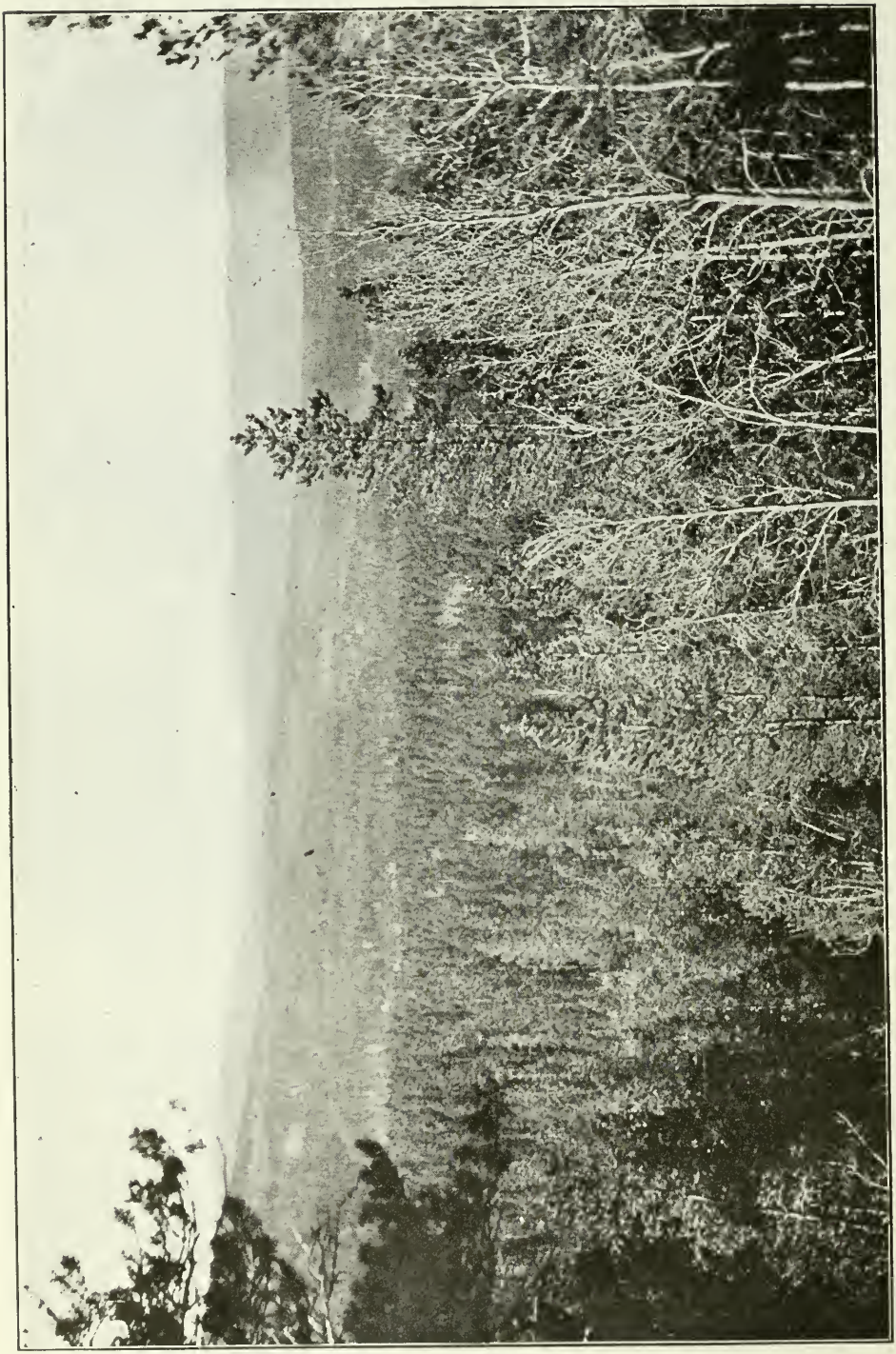
Mr. E. J. Zavitz, Forester of Ontario, who was recently given charge by Hon. G. H. Ferguson of the new department to re-organize the forest protection service will spend the greater part of the winter in Northern Ontario locating the areas most in need of protection and arranging for co-operative action wherever possible. A Toronto newspaper article has the following:

"Hon. Mr. Ferguson has been in communication with representative lumbermen for some time on the subject, and it is expected the lumbering companies, having a common interest with the Province in protecting the forests, will assist in the work of fire prevention and bear their share of the cost.

Thousands of bushels of timothy and alsike clover seed are to be sent into the burned-over areas of Northern Ontario next spring to make good the damage to pasturage.

The Minister further announced that he intended to have all Government lands in the burned districts seeded. The seeding would serve a double purpose in that it would by furnishing a green cover help to prevent the starting and spread of fresh fires, and by furnishing thousands of acres of good pasture land for settlers' cattle. The step is an extension of the plan adopted this summer of furnishing free seed to settlers to fix up their pasture.

To protect the small municipalities in the North whose safety is menaced by the presence of standing timber near their doors, it is possible that legislation will be introduced this session to give the corporations some authority over wooded lots in the surrounding country. In some sections of the north owners of land close to the towns have left it standing, unimproved for years. It was the proximity of such wooded lots to several of the municipalities in the North that brought about their destruction last summer. The matter has not been definitely decided upon, but some such plan is to be shaped up."



TIMBER RESOURCES OF ALBERTA.
Lodgepole pine on headwaters of the Swan River.

# HOW QUEBEC ASSOCIATIONS RID THE FOREST OF SETTLERS' HAZARDS

## Remarkable Record Achieved in 1916 on more than 24,000 Square Miles of Timber Lands

In the 12,000 square miles of Quebec, patrolled by rangers of the St. Maurice Forest Protective Association, 1213 settlers living in timbered districts where carelessness with fire is a direct bid for a catastrophe took out 'burning permits' during the summer of 1916 in accordance with the Quebec law.

They took out the permits for more reasons than fear of a legal penalty. The written permit to burn the slash in their clearings was equal to an insurance policy on their lives, their homes, and the valuable timber of the neighborhood. By means of the 'permit' a skilled ranger supervised their dangerous slash fires. He made the job a safe one. The settler got a thorough 'burn' to clean up his land, but he made sure of preventing another 'Claybelt Horror'. No red tape. Nothing unreasonable. Today, the Quebec settler in that district holds up both hands for the 'burning permit.'

1213 settlers' fires in 1916 in the St. Maurice area! And *not one fire got away*. Every fire a safe fire! Only one settler refused to co-operate in playing safe; he was prosecuted and fined.

### *More Proof*

Over 1000 settlers' permits were issued in another 12000 square miles of Quebec, patrolled by the Lower Ottawa Forest Protective Association. How many of them escaped from the clearings? *One.* And it did practically no damage before it was extinguished. Why this remarkable change from the old days when forest holocausts (produced frequently from runaway fires in settlers' land-clearing operations) ravaged whole townships and destroyed lives and property? First: a law requiring the settler to take out a 'permit' before burning his slash; second: a vigilant, thorough system of forest patrol by qualified rangers.

The Claybelt Horror came to Ontario's northland in 1916 because in the absence of any 'permit law' or patrol system, hundreds of settlers' fires got loose at the hottest part of midsummer and swept like a cyclone across 800,000 acres between Matheson and Cochrane.

### *A Warning to the West*

Most of the new immigration in the prairie provinces is taking up lands in the northern timbered areas, thereby duplicating the forest fire hazard of the Ontario Claybelt.

As with Ontario in 1916, and in the old days of the sections of Quebec referred to, settlers' clearing fires can be set out in the hottest weather, on the windiest days, with slash piled dangerously against the edge of standing timber. No existing law (except in Manitoba, where it is not enforced) prohibits such disregard of grave risks. Any year of drought may duplicate for Manitoba, Saskatchewan, or Alberta, the terrible events in Northern Ontario in July last.

The only known safeguard against wanton destruction of lives and timber possessions in settled forest lands is the enforcement of 'burning permits'

The plan has worked with striking success in British Columbia, Nova Scotia, large areas of Quebec, in many of the States of the American union and will soon be operated in Ontario. It has won the sympathy and co-operation of settlers wherever applied.

Is the West ready to protect itself?

## DEATH OF 'DON' BROPHY.

John Bernard Brophy, known in athletic circles as 'Don', a member of the staff of the Dominion Forestry Branch, Ottawa, was killed in England on Christmas Day in an aeroplane accident. He was a son of Mr. John B. Brophy, C.E. of the Public Works Department and after attending McGill University was engaged in the draughting department of the Forestry Branch.

Enlisting in October, 1915, he was sent overseas in November and underwent training as an aviator. He saw much active service in the flying corps and after a series of exploits redounding greatly to his credit, was wounded and sent to England. There he was engaged in air patrol duties when an accident occurred to his machine during a flight.

### Fire Rangers' Annual Meeting.

The annual meeting of the Dominion fire rangers was held at Revelstoke, B.C., recently. Reports were presented by all the rangers present, which showed that good results had been secured in the prevention of forest fires. A number of resolutions were adopted, among them being the following :

"That the provincial government be requested to extend the permit period for the season from September 15 to September 30."

"That the provincial government be requested in future when constructing new roads to dispose of the debris as they go along, instead of leaving it lying at the roadside, as it is a great fire danger."

### Waste of Wood in Sawmills.

There are more than 48,000 sawmills in the United States, and their output of waste in the form of sawdust, shavings, slabs, and other wood refuse is estimated as 36 million cords per year. This is equal to over 4½ billion cubic feet of waste, which is the capacity of a bin one-half mile high with a base covering a forty-acre lot. Or, considering each cord to contain eighty cubic feet of solid wood with all the cracks and air spaces taken out, these 36 million cords would make a block of wood more than a quarter of a mile on each edge.

Perhaps one-half of this so-called waste product is not, strictly speaking, wasted, but serves a useful purpose as fuel under the boilers. Much of the remaining 18 million cords not only serves no useful purpose, but in most cases is a source of inconvenience and danger, and costs the mill time and money.

## *Fire Protective Convention Feb. 1 and 2*

A rousing convention of those concerned with forest fire protective work will be held at Montreal, Thursday and Friday, February 1 and 2. Invitations have been sent to the lumber companies, Federal and Provincial Government officials, inspectors of the St. Maurice and Lower Ottawa Forest Protective Associations, etc. The convention has been organized by the St. Maurice Association officials.

It is expected that the speakers will include E. T. Allen, Forester of the Western Forestry and Conservation Association, Portland, Oregon; A. E. Graham, Manager of the Lower Ottawa Association; T. B. Wyman, Forester, of Munising, Mich., W. R. Brown, Berlin Mills, N. H.; G. A. Gutches, Dominion Forestry Branch, Prince Albert; and others. The topics will have great variety and interest and an invitation is extended to members of the Canadian Forestry Association to be present.

# FORESTS IN ITALIAN AND BALKAN WAR ZONES

## A Graphic and Detailed Picture of Forest Conditions Where Armies Meet for Battle.

*By Prof. J. S. Illick*

The forests of the Mediterranean peninsulas, viz: The Iberian, comprising Spain and Portugal; the *Italian*, including Italy and a few adjoining provinces of Austria; and the *Balkan*, consisting of Servia, Roumania, Bulgaria, Greece, Albania, Montenegro, European Turkey, and a few of the southern provinces of Austria have never been favored naturally nor biologically. Nature did not produce there, as in America, vast and dense forests of valuable species. The original forest was, as a rule, only mediocre in density and composition. Furthermore, man and a score of other destructive agencies, particularly goats, have been abusing the forests ever since they have been opened up to such an extent that today one finds in the countries about the Mediterranean some of the poorest forests of continental Europe. They stand in strong contrast with the forests of Belgium, northern France, eastern Prussia, western Russia, and Galicia.

In 1911 the writer had the privilege of accompanying Prof. Gustav Hegi, of the University of Munich, on a botanical and dendrological study-tour through a portion of the country now occupied by the contending armies in the southeastern theatre of the war. A considerable portion of the trip was made afoot through rather remote regions. This enabled the participants to observe the forests and other allied rural conditions at close range. It would not be possible to discuss within the space of a short article the forest conditions found on the three Mediterranean peninsulas, nor even of the countries comprising the Italian and Balkan peninsulas, most of which are engaged in the present war. Therefore, it seemed advisable to confine the present article to a limited portion with forest conditions fairly representative of the whole. The region about the Austro-Italian front has been selected for this purpose.

### *Once Forested.*

The principal provinces which Italy hopes to regain from Austria are Trentino and Gorizia. In them most of the recent battles between the Austrian and Italian troops have been fought. The former province projects into northern Italy in the form of a blunt wedge; the latter borders Italy on the extreme northeast above the Gulf of Trieste. These two provinces form the backbone of the "Italia irredenta." History informs us that these provinces were originally forested with stands of average density yielding a fair quality of material. But conditions have changed. Today forests are conspicuous by their absence, not only upon limited areas, but over an enormous territory. Thousands of Italian immigrants have never seen a real forest before coming to America. The forests of their homeland have been destroyed by the conjoint destructive work and devastating abuse of many agencies. Excepting the steep slopes of the Alps, the more inaccessible tops of the Apennines, a few remote plateaus and scattered

spots bordering bodies of water, the forests of Italy are in reality miserable brushland. Acres of desolation—the result of centuries of forest abuse—abound on every hand. All Europe does not contain a more deplorable picture on so wholesale a scale.

*Reasons for Neglect*

One wonders why forest destruction was allowed to continue for so long a time and on so gigantic and intensive a scale, for it seems as if the ultimate outcome of such a process must have been foreseen. The writings of foresters as far back as the middle ages bear evidence that the significance of such a destructive tendency was comprehended. They were, however, unable to accomplish much because political disturbances and inefficent management had impoverished the public treasury, and the spirit of the people was antagonistic to anything which implied present sacrifice for future gain. Furthermore, the need of forest products—the real stimulant of forest conservation—was never keenly felt in this sunny and peninsular southland. The warm climate and the absence of extensive wood-using industries reduced the demand for fuelwood and raw material of larger size, and accessibility by sea made the importation of needed wood material feasible. Not much material was needed; and the small amount which was required could be imported cheaper and easier than it could be raised at home. But these are only the primary causes for the present poor forests. Secondary destructive agencies became operative as soon as the forests had been opened up and partly removed, and have been conducting a destructive campaign ever since on such a wholesale and continuous a scale that the resultant damage far surpasses that of the primary causative factors. There are a large number of these secondary destructive agencies which in many cases have impoverished the land almost, if not entirely, beyond redemption. Fire, goats, erosion and floods, are the principal secondary malefactors, and a brief account of the nature and extent of their destruction may serve as a valuable lesson to us in America, now in the formative period of forest conservation.

*Heavy Fire Damage*

Wasteful lumbering was followed by destructive forest fires which burned over the mountain slopes repeatedly. They were aided by the hot and dry climate and high winds; and, as a rule, unhindered by man. Various governing bodies passed laws pertaining to the prevention and extinguishing of forest fires, but were powerless to enforce them. The public gave little attention to them because it was realized that the evil effect was deferred rather than immediate. Upon these burnt-over areas there appeared a dense fire-coppice growth of brush consisting of shrubs, many inferior, and a few valuable trees.

This shrubby growth afforded excellent pasture for goats, which the inhabitants considered more indispensable to their welfare than forests. Under such conditions the goat industry naturally grew, but the forests disappeared; and now, in view of the damage already done, the goat is regarded as the most destructive enemy of the forests of northern Italy and other nearby mountainous countries. They are present everywhere in large numbers. There is no city, village, hamlet, nor hardly a home or an acre of mountain land without them. According to a late census there are about 2,000,000 goats in Italy; that is, about one goat to every 16 inhabitants or about one goat to every 5 acres of forest land.

As soon as the forest cover with its absorbent carpet of leaf-litter is removed or destroyed, the fertile forest soil—the result of centuries of vegetable accumulation and rock disintegration—is exposed to the devastating influence of rain and snow water. The process of erosion soon begins on a small scale and increases with each successive rain or snowfall, until practically all the productive soil has been removed and nothing remains except bare rocks, forming abrupt cliffs or strewn over precipitous slopes. In summer these slopes assume a thirsty and parched appearance, and the rivers which they feed are but

narrow threads trickling through broad beds. In springtime these same slopes are the birthplace of raging torrents which burst forth with uncontrollable force in the plains below, inundating fertile fields and depositing enormous quantities of detritus at undesirable places. There are more than 600 miles of artificial embankments along the Poe river, which meanders through a rich but almost treeless agricultural region after bursting forth from the mountains. A large number of protective structures exist along the Adige river, which flows through the center of the province of Trentino in which many fierce battles have recently been fought. Both of the contending armies have suffered severely from heavy rains and spring floods. Reports tell us that many groups of soldiers have lost their lives in crossing and recrossing this stream when swollen and raging. In order to obtain a real vivid and lasting impression of this desolate region, one should approach it from the north, that is, immediately after having spent some time in the intensively managed and normally stocked forests of central Europe. In Belgium, France, Prussia, Russia and Galicia, the soldiers seek shelter in woods, cover their batteries with branches and faggots, corduroy roads with poles, line their trenches with poles and props, and finish their subterranean chambers with sawed timber. The soldiers of the armies operating in the Tyrolean Alps are not so fortunate. No wood is at their disposal, for they are located in an almost forestless region. Consequently they are compelled to seek shelter amidst enormous rocks which cover the slopes and to drill chambers into the solid rock formations which crown commanding heights. Under such conditions the contending armies cannot do much damage to the forest growth, but they are certainly making the task of the future reforestation more difficult. The present damage may not be so great, but the ultimate, and in many cases irreparable loss will be felt by many subsequent generations.

*Italy's Tree Assets*

One must not conclude from the foregoing description that Italy is treeless. It has many valuable trees, but most of them occur in orchards and parks, on estates and lawns, and along streets and boundary lines. There are in Italy about 2,000,000 acres in olive groves, and 400,00 acres in chestnut orchards, and thousands of mulberry trees which support the silkworm industry. The lemon industry holds a prominent place about the subalpine lakes, because of the superior fruit produced. An enormous number of trees are also required to supply props for the vineyards which cover almost nine million acres.

The Italian government has not been unmindful of the need of forest conservation and restoration. Numerous protective and constructive laws have been enacted, but little was accomplished until about 1877. Since then the land has been classified and protection forests have been established on the higher mountain slopes. Special inducements are given to individuals and communities who reforest mountain land. In 1902 it was decided to celebrate a "Feast of Trees" (la festa degli ableri), copied after Arbor Day of the United States. On March 31, 1902, the city of Rome held the first celebration in the presence of the king and the queen, planting about 10 acres with trees. A forestry school is maintained at Vallombrosa, located in the heart of the Apennines, and easily visited from Florence. It is surrounded by magnificent forests, and far removed from the whining beggars, ringing bells, plaintive yells, and offensive smells so characteristic of Italian cities.

*Forests of Austria.*

The forests of Austria, as a rule, are carefully managed and well stocked. The provinces bordering Italy, however, are an exception to this rule. They bear no evidence of that careful management so characteristic of the forests in the interior of the empire. These provinces have been under Austrian rule for more than a century, but no traveller would know it if it were not for the postage

stamps, money, and laws. The atmosphere is decidedly Italian, the government alone is Teutonic. A sojourn of a few days in cities and a longer period of travel on foot through rural portions of these provinces furnished abundant and convincing proof to the writer that the inhabitants were eagerly and almost unanimously awaiting the day when they would be redeemed or incorporated into the kingdom of Italy. This prolonged political unrest may be at least a partial explanation for the present unsatisfactory forest conditions.

The forests of the other countries of southern Europe, most of them now at war, are not exactly like those described but they have many points in common. They are, as a rule, poorly stocked and mismanaged. A general perspective may be obtained by classifying them under two headings, viz.: wood importing and wood exporting countries.

| *Wood Importing,* | *Wood Exporting,* |
|---|---|
| Italy, | Roumania, |
| Servia, | Bulgaria. |
| Greece, | |
| Spain, | |
| Portugal, | |
| Turkey. | |

All the above-named wood importing countries, except Servia, have a small forest area per capita of population. Servia has a total forest area of 3,750,000 acres, about 37 per cent. of which is classified as state forest land. In spite of this large forest area considerably more wood is imported than exported. This is due to the unorganized condition of forest utilization. Roumania and Bulgaria, the only countries whose exports exceed imports, have forest areas of 6,250,000 and 7,570,000 acres respectively. In both countries the hardwood, chiefly oaks, beech, elm and walnut in the southern part of Bulgaria, comprise more than 75 per cent. of the forest area. These extensive and unexploited forests are a valuable asset and will become more valuable as reconstruction progresses after the war. The consequent loss, however, will be enormous and the damage in innumerable cases irreparable.

J. S. ILLICK.

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**From "Among The Trees."**

Ye have no history. I ask in vain
Who planted on this slope this lofty group
Of ancient pear-trees that with the springtime burst
Into such breadth of bloom. . . . Who was it laid
Their infant roots in earth, and tenderly
Cherished the delicate sprays, I ask in vain,
Yet bless the unknown hand to which I owe
The annual festival of trees, these songs
Of birds within their leafy screen, these shouts
Of joy, from children gathering up the fruit,
Shaken in August from the willing boughs.

—Bryant.

---

**B. C. Exporters Co-operate.**

Arrangements have been completed in Victoria, B.C., between all the exporting manufacturers of lumber in the province, with one exception, to pool their output for export purposes and have it handled by the Canadian Trading Company, which was incorporated for this purpose recently under British Columbia legislation. This company, through its connections in London and San Francisco, will be able to guarantee tonnage for lumber shipments within a very short time, and has also chartered all the vessels now being built in British Columbia yards for the lumber trade, with one exception.

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There are 2,580 daily newspapers in the United States.

# The Ancient Cedars of Lebanon

*By Guy E. Mitchell*

The great Cedars of Lebanon are among the most interesting living records of the past. The grove which is standing to-day is the remnant of the same forest from which the cedars were cut and hewn for the building of the Temple at Jerusalem by Solomon. There are many references to the Cedars of Lebanon in the Old Testament, the most notable in First Kings, where it is stated that through the cooperation of Hiram, the King of Tyre, Solomon brought great rafts of cedar from Lebanon to Joppa and carried them up the steep mountain-sides to Jerusalem for the first temple. In the building of the second temple, under Ezra and Nehemiah, the timbers were procured from the same cedar forest on the slopes of Mount Lebanon. At an earlier period the Psalmist refers to the Cedars as the ornament of Lebanon and one of the great glories of God's creative power and wisdom. Pliny, the Greek naturalist, named the species *Cedrus magna*, meaning "great."

The impressive thing about this ancient grove of cedars is the knowledge that the oldest and largest of them were undoubtedly living at the time when the timbers of their immediate predecessors supported the Temple. They are upwards of 2000 years old, not so old as the great Sequoias of our Pacific Coast, but still very ancient. At present there are only about 400 trees left, all very large and old. The best preserved are about 100 feet high and one has a circumference of 47 feet. The grove is now protected by a well-built, high stone wall; but all the balance of the great cedar forest of Lebanon has succumbed to the greed of man, and the grove stands like an oasis in the desert.

In considering the otherwise absolute destruction of the forest over the entire mountain-side, one cannot help but wonder why this group has been preserved. A probable explanation is found in the name of the stream at the foot of the mountain—the Kadisha—which rises in the moraine left by the great glacier which swept down from the summit of Lebanon and on which the Cedars of Lebanon throve during early Biblical times. This word is the Hebrew for "holy" and the grove has undoubtedly been preserved because of its sacred character. The natives to-day will tell you that the grove is sacred because it "was planted by Jesus Christ,"—a belief which finds the semblance of justification from a poetical passage in the 104th Psalm referring to "the Cedars of Lebanon which the Lord has planted."

As the traveler stands on the summit of Lebanon, nearly 10,000 feet high, and looks down upon this ancient grove, the remnant of a mighty forest, and upon the still more ancient glacial moraine upon which it grew, and sees upon the flank of Lebanon the ruins of ancient temples and the vast expanse of the Mediterranean beyond, and to the east the distant ruins of Syrian Baalbek, he may recall the force of the words of Holy Writ, "all flesh is grass and as the flower of the field it perisheth." Over this expanse, witnessed by these trees and their immediate predecessors, have come and gone all the great nations of antiquity. Here are the relics of the Assyrian, the Babylonian, the Egyptian, the Phoenician, the Greek, the Roman, the Moslem, but yesterday, as it seems, the Crusader, and now the warring Turk and Slav. And each has done, and perhaps to-day is doing, his part to destroy the mountains' noble covering of forest and to add to the desolation wrought by his predecessor. Could the process but be reversed, and the greed of man restrained and protection be

given to the reforesting of the region. the Cedars of Lebanon might again become, as in the days of the Psalmist, the glory of the mountains. —(From American Forestry).

### "Real Forest Fire Protection for Ontario"

("*Canada Lumberman*")

"The announcement made by the Minister of Lands, Forests, and Mines for the Province of Ontario that his department is coming into line with those of several other Canadian provinces and adopting modern methods of fire prevention, so as to put an end to the enormous annual losses of standing timber, is a welcome piece of news. It means, we feel safe in predicting, that if the methods used in the other provinces are properly adopted and rigidly put into operation in Ontario, we have now experienced the last of our great conflagrations in the forest districts of Northern Ontario such as that which during the past summer wiped out of existence hundreds of settlers, together with their homes and effects, and caused incalculable damage to our standing timber. It means, too, that the families going into Northern Ontario to settle can depend in future upon practical protection against such calamities, and so feel encouraged to undertake the task of settling in the new country. Undoubtedly the prevention of forest fires will have the double effect of saving timber and giving a stimulus to settlement.

A great source of difficulty in the past has been the conflict of interests between timber owners, settlers, and prospectors, together with the inability of the individual settler to protect himself against the carelessness of others. This can now be entirely done away with. The time of year at which the Minister has made his announcement is a fortunate one, because between now and the next danger season in the summer of 1917 there will be time enough to arrange details and appoint the necessary staff to put the system into effect sufficiently to reduce greatly and probably almost eliminate the fire losses that we could otherwise predict with certainty for next year."

### Paper Suspensions.

Eight hundred country newspapers have suspended in the United States since the price of news print paper began advancing, according to a statement made before the California Press Association.

### Asking The Settlers' Help.

The ingenuity of some of the northern fire rangers in the prairie provinces in working up publicity schemes to aid fire prevention has often received a deserved testimony. The Association recently received a unique book of photographs fashioned between birch bark covers, and with typewritten text graphically describing the case for forest protection. It was the work of Jas. T. Blackford, Chief Fire Ranger of the Dominion Forestry Branch at Norway House, Manitoba. The only means of access to the country patrolled by Mr. Blackford and his men is by steamboat, and the book was placed on a table of the steamer so that hundreds of travellers coming in and out read it through. On the cover are the words: "Manitoba North Fire Ranging District, Patriotic Slogan: 'No Fires in 1916.' It is hoped that such happy ideas will be put into practice elsewhere.

### Lightning Hits Chestnuts.

Lightning shows a marked preference for chestnut trees, according to data based on reports submitted to the U.S. Department of Forestry by its foresters. Of a total of about 2,000 trees struck by lightning on the State Forests in the past four years, 655 were chestnut. Pitch pine comes next with 327 trees struck, and then follow in order rock oak, white pine, hemlock, red oak, white oak, black oak, locust, and sugar maple. Black birch is at the foot of the list with only one tree struck in four years. Poplar and walnut come next, only two of each being struck.

# 1,000 NEW MEMBERS JOINED IN 1916

## Successful Ending to Twelve-Months' Effort in Building up Strength of the Canadian Forestry Association

The goal of 1000 new members for the Canadian Forestry Association in the twelve months of 1916 has been reached.

After a membership campaign carried on by the office of the Association during the year, stimulated from time to time by special appeals to the old members, the final fifty of the thousand arrived after the month of December had come perilously near its close.

The total membership is now 4350, which represents an increase of 50 per cent. during the last two years. The period in which this growth has taken place has been most unpropitious to the development of any society or movement not directly linked to the War. The promise of a much greater development after the declaration of peace is, therefore, very encouraging.

The distribution of the membership is approximately as follows: Ontario 1300; Quebec 800; Prairie Provinces 900; British Columbia 500; New Brunswick and Nova Scotia 500; United States and British Dominions 300. There are also 200 newspaper editors who are Special Members of the Association, not being subject to fees. The increase in membership, as noted, does not, of course, take account of any but paying members. The Association also sends packets of free copies of the Journal to Military Hospitals, Convalescent Homes, reading camps in the woods, camps of the forestry battalions etc., and to many prospective members thus bringing the total circulation of the monthly to 4700 copies.

While the great majority of members have no business connection with forests or forest industries and are giving their support solely from motives of good citizenship and a personal interest in the beauty and utility of flourishing woodlands from the standpoint of camper, fisherman, hunter, etc., it has been a gratifying circumstance that during 1916 a large number of lumber, and pulp and paper firms, their officials and senior employees, became linked to the Forestry Association. Their assurances of interest in the work have been most hearty.

The loss in old members during 1916 was notably small. There were some cancellations of membership by death, a few by change of residence and inability of postal authorities to learn the new address, but fewer than fifteen in a total of over 4000 have voluntarily resigned.

It is intended that the Canadian Forestry Journal which has developed during the past eighteen months from 16 to 48 pages shall be further enlarged and much improved in point of appearance and contents.

To the many members who have given the Association splendid support in developing our numerical strength the Secretary wishes to express his hearty thanks.

### 400 Acres Planted.

Director of Forestry R. H. Campbell recently visited the Laurentide Company, Limited, plantations at Grand'mere, Quebec. There are about 400 acres of plantations all the way from one year to four years old. These consist of Norway Spruce and Scotch Pine in mixture; Scotch Pine; White Pine, and Norway Pine in mixture; and Norway Spruce in pure stand. The Norway Spruce has also been planted in the open under the shelter of White Birch and Poplar,

and also underplanted on land which has been logged over. The plantations are doing very well—the loss in Norway Spruce being less than one per cent, and all of the plantations are now beginning to show up in first class shape. A visit was also paid to a lumbering operation on land which had been heavily cut over for soft wood, the remaining stand consisting of large Hemlock and hard wood, mostly White and Yellow Birch, and Maple, and small Spruce, Balsam and Cedar. Practically all of the hardwood has been removed so as to give an opportunity for the soft wood reproduction to take place, and, where this has failed, planting operations will be begun next Spring. Fire lines have been cut, and all the brush cut from them, and in cases operations have been burnt, and this has left the ground in good shape, and is a good example of what can be done along these lines. Mr. Campbell expressed himself as well pleased with the Laurentide Company's operations.

### Wood Wharves vs. Concrete.

The Port Commission of Seattle, Wash., of which J. R. West is chief engineer, in answer to criticism on the use of timber and pile construction in the Seattle wharves, has replied that wharves and freight sheds such as have been built by the port will have a life of probably from 20 to 25 years, which is also about the economically useful life of such a structure.

The Commission adds that conditions of water transportation are constantly changing, and this will render terminal structures obsolete after a certain number of years, this period being on the average about 25 years.

It has not been demonstrated that concrete made of Portland cement is permanent in salt water. If it does not prove to be permanent, then the added cost is not in any way justified, and if it does prove permanent then the physical life of a wharf would exceed its useful life, which is not economical.

Another argument in favor of the cheaper creosoted pile and timber construction which is particularly true of Seattle, says the Commission, is that a given amount of money can be made to produce more terminal facilities to invite new business than could be provided if the more expensive type of construction had been adopted.

## *Keep Woodlots Clear of Animals*

One of the most important steps to be taken in the care of the woodlot is its protection from fire and animals. Fire should never be allowed to run through it, for not only does this destroy seedling trees and injure large ones, but it also destroys the litter and vegetable matter on the ground and leaves the soil exposed to the drying influence of the sun and wind.

Pasturing animals in the woodlot is a great hindrance to the proper development. Cattle, in addition to eating off the tops of small trees, destroy the undergrowth and thus allow the sun to act on the soil and grass and weeds to establish themselves. The result is the larger trees begin to slowly die at the top and decay sets in.

In woodlots that have in the past been neglected and now contain many more or less open and grassy spots it may be advisable to pasture hogs for a time in the fall. These animals by rooting about stir up the soil and put it in good condition to receive the seeds when they fall from the trees and thus a new growth of young trees is started.—B. R. Morton, B. Sc. F.

# British Foresters in the Cameroons

The following letter has been received from Mr. A. H. Unwin who is in the British Forestry Service in Nigeria, Africa. Mr. Unwin was formerly in the Dominion Forestry Service, and is a member of the Canadian Society of Forest Engineers. The letter is as follows: "In Nigeria I am in charge of the Working Plans Division, but since I came back this time I have been transferred to the British Sphere of the Cameroons (late German Colony) to report on the plantations and forests as well as the Agricultural resources. Needless to say the Southern Forests, such as I have seen of them, are grand with plenty of Mahogany of various kinds, besides Ebony, rubber and bullet wood, also ironwood. Most of the land is really covered with forest, except for the small clearings of the natives here and there. The Germans had not developed the timber industry in this part very much; in fact, compared to Nigeria, they had been very slow in taking up Forestry and only had six men in all, compared to Nigeria's sixteen at the same date. They had, however, done a certain amount of planting at the District Stations, chiefly with Teak, rubber Cocoa, Indian blackwood, as well as what they called German Steamer. I cannot quite make out what they meant by this. They had planned to plant in the drier regions away from the Coast, but little had been done before the war. Now we will hope they will not be allowed to return. Several large rivers for floating logs are found both North and South, notably the Cross River and the Mungo, as well as four other rather smaller ones, the Akwayefe, Ndian, Moko and Meme. On the whole too it is quite a mountainous country, the Cameroon itself being 13,000 feet high, and then there are several ranges, such as the Rumpi, 4000 odd, on which they are good stands of timber. The chief difficulty in dealing with tracts is that there are so many different species on a given unit of area that it is almost impossible to make it pay with any great length of haul to a waterway. I have found as many as 73 species of trees in a valuation survey two chains wide and three miles long, and that is not a large number. The known species of timber trees regardless of shrub trees in this part is about 300, quite apart from the unnamed trees. It is like a vast arboricultural collection, all mixed up without labels, and overgrown with creepers and undergrowth into the bargain."

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### The Bird Treaty.

All bird lovers will rejoice to know that a treaty has been entered into between the United States and Great Britain to protect migratory birds in this country and Canada. By three great highways the birds and the waterfowl pass back and forth between the two countries. One is along our Eastern Atlantic coast, another is by way of the land included in the Mississippi valley, the other is the Pacific slope west of the Rocky Mountains. There is also a northern, or breeding zone, and a southern, or wintering zone. While in passage, and while in the north or in the south our migratory insectivorous birds will have the protection of both governments, the game birds also will be protected under laws and regulations agreed upon.

The last two or three years have been wonderful years for the birds in the way of the legal protection obtained for them. On the one hand economy, claiming that toward a billion dollars a year is lost to the farmers because of insect pests, which the birds, if not destroyed, might largely have cared for, and on the other hand the sportsman, seeking protection for game birds that he may still have hish unting season, have

joined with the real lovers of birds to bring this about. Wise men have long insisted that from the point of view of economy alone, the protection of our birds would ultimately arouse, as it has, the interest of the nations.—("Our Dumb Animals.")

### New York To Buy Forests.

At the recent election the people of New York State voted to tax themselves $10,000,000 for the purchase of forest preserves. The fact that this was not done by act of legislature, but by a referendum, shows how popular the idea of state forests has become with the people at large, says "American Forestry." The forest preserves of New York are not only of great economic importance for the preservation of the water supply and of local industries, but serve as an immense park which is visited annually by millions of people. Of the total amount voted, $7,500,000 will be available for further purchases in the Adirondacks and Catskills, where the State owns already 1,814,550 acres of forests and lakes, and $2,500,000 for the Highlands of the Hudson Preserve. A private subscription of a like sum had already been secured contingent on the passage of this proposition of the referendum. There will, therefore, be available altogether $5,000,000 for the completion of a great interstate park in the Highlands of the Hudson.

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This splendid example set by a wealthy state will undoubtedly have a valuable influence on other eastern states. The fourteen thousand acres which the Vermont Forestry Department has acquired is a good start in the right direction, but it is only a drop in the bucket compared to the 3,000,000 acres of woodland in the State.

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### Fuel Value of Wood vs. Coal

The fuel value of 2 pounds of wood is roughly equivalent to that of 1 pound of coal. This is given as the result of certain calculations now being made in the Forest Service laboratory, which show also about how many cords of certain kinds of wood are required to obtain an amount of heat equal to that in a ton of coal.

Certain kinds of wood, such as hickory, oak, beech, birch, hard maple, ash, elm, locust, longleaf pine, and cherry, have fairly high heat values and only one cord of seasoned wood of these species is required to equal one ton of good coal.

It takes a cord and a half of shortleaf pine, hemlock, red gum, Douglas fir, sycamore, and soft maple to equal a ton of coal, and two cords of cedar, redwood, poplar, catalpa, Norway pine, cypress, basswood, spruce and white pine.

Equal weights of dry, non-resinous woods, however, are said to have practically the same heat value regardless of species, and as a consequence it can be stated as a general proposition that the heavier the wood the more heat to the cord. Weight for weight, however, there is very little difference between various species; the average heat for all that have been calculated is 4,600 calories, or heart units, per kilogram. A kilogram of resin will develop 9,400 heat units, or about twice the average for wood. As a consequence, resinous woods have a greater heat value per pound than non-resinous woods, and this increased value varies, of course, with the resin content.

The available heat value of a cord

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of wood depends on many different factors. It has a relation not only to the amount of resin it contains but to the amount of moisture present. Furthermore, cords vary as to the amount of solid wood they contain, even when they are of the standard dimension and occupy 128 cubic feet of space. A certain proportion of this space is made up of air spaces between the sticks, and this air space may be considerable in a cord made of twisted, crooked, and knotty sticks. Out of the 128 cubic feet, a fair average of solid wood is about 80 cubic feet.—American Forestry.

# Cost of Clearing Land By Two Methods

*Experimental Farm Bulletin*

When time is no object, the best way to clear land from timber growth is to let nature and live stock assist. When the growth is removed and the brush burned off clean, which, with most growths, may be made a profitable operation by the sale of the timber and fire-wood, clover and grass seed may be sown, and, while cattle and sheep are pasturing and eating down the sprouts, the stumps will slowly but surely decay, and their removal becomes an easy operation. This process will require from six to ten years before clearing can be completed.

At the Experimental Station, Fredericton, N.B., where it was desired to bring the land into cultivation at the earliest possible moment, two plans of stump removal have been tried, and herewith are given figures of the relative cost on land from which an average tree growth had been removed. The two methods employed were, stump pulling by power, and removal by dynamite.

A stump puller of the drum and long lever type was employed, giving a lifting power of 25 tons with an ordinary team. With one hundred and twenty stumps, 10 inches and over to the acre, and seventy-two smaller stumps, it required an average of twenty minutes with a team and driver and two men to remove each of the large stumps and 5 minutes to remove each of the smaller ones. The 120 stumps required 40 hours, and the smaller ones 6 hours.

The relative cost, therefore, stood as follows:—Where Power machinery was used, cost per acre was:

| | |
|---|---|
| 46 hours work team and driver at 32c | $ 14.72 |
| 92 hours work helpers at 18c | 16.56 |
| 330 hours work cleaning and piling at 18c | 59.40 |
| 60 hours work burning at 18c | 10.80 |
| | $101.48 |

Where explosives were used, the cost per acre was:

| | |
|---|---|
| 150 lbs. Stumping powder at $14.90 | $ 22.35 |
| 500 feet Fuse at 60c | 3.00 |
| 300 Caps at $1.00 | 3.00 |
| 40 hrs. labor of Dynamite operator at 23c | 9.20 |
| 40 hrs. team and driver at 32c | 12.80 |
| 80 hrs. helpers at 18c | 14.40 |
| 60 hrs. labor piling at 18c | 10.80 |
| 40 hrs. labor burning at 18c | 7.20 |
| | $82.75 |

On other areas, where there were heavy boulders and small stones, the cost of clearing ran up to $186.00 per acre, while, where the land was free from stone, and stumps were small and comparatively few, the land was made ready for the plough at a cost of less than $40.00 per acre.

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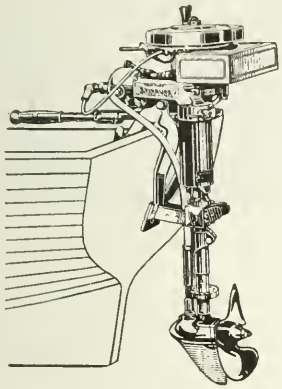

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# *How British Columbia Protects Forests*

In response to a request from the Canadian Forestry Journal the following summary of the advances made in British Columbia's forest management has been received from the Acting-Forester, Mr. M. A. Grainger.

"Since 1912 the chief advances in fire protection have been:—(1) Each license and lease holder has been assessed 1c per acre in 1912 and 1½c per acre in each year since, for forest protection purposes only. This Tax with an equal amount from General Revenue forms the "Forest Protection Fund." Previous to 1912 the Government paid directly all patrol and fire fighting expenses, and spent nothing on improvements.

(2) The creation of Forest Districts, now 10 in number, each in charge of a District Forester. He in turn is assisted by a number of rangers, from 2 to 6, usually employed permanently, and who are able to supervise closely the work of the temporary forest protection force. This gives close personal supervision of each man's work. In other words the supervision has been tightened up so that the management has close control of each employee's work. This is the most important thing that has been done.

(3) Permanent Improvements.

*Area Under Patrol.*

(4) The area under patrol has been increased, from 123 million in 1910 to nearly 150 million acres. This increase is due to large areas in the north having been brought under some measure of patrol.

(5) Statistics of fire damage etc., have been standardized, so that results are directly comparable from year to year. More careful reports on all fires, however small, are de-

manded in order that statistics may be of the utmost value.

(6) Various economies have been effected, in modes of transportation, allowances, expenses, and in fire fighting.

(7) A systematic campaign of education has been conducted showing every citizen what he gains from forest industries, and how he may assist in perpetuating the industry by using care with fire.

About 11 million acres is taxed for Forest Protection purposes, and as previously stated, 150 million acres is patrolled. This Branch has always followed the policy of attacking fires at the beginning, no matter where they originated, whether on lands paying Forest Protection Tax or not. Owners of lands which do not pay such tax are required, however, to give their services, and those of their employees, free until the fire is extinguished.

*Slash Burning.*

Slash burning is ordinarily not compulsory, although it usually is made so in the case of timber sales. Operators must, however, burn slash they make within 200 feet of a railway right-of-way, and in a number of other places which are considered particularly dangerous.

Any area of slash may be declared a public nuisance, if it endangers life and property, and the operator in such cases is required to make it safe, either by burning or by constructing a fire line. This provision has rarely been used, as better success has attended a campaign of education, many operators having voluntarily decided to burn their slash.

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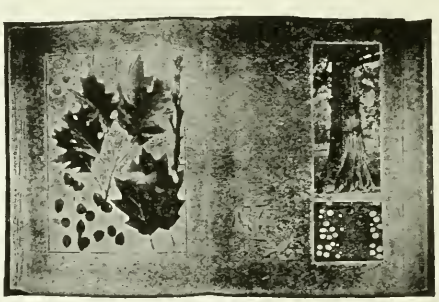
**Fire Undermining Canada's Position**

An interesting view regarding forest conservation is expressed by Mr. I. H. Weldon, President of the Provincial Paper Mills, Limited, Toronto, in an interview in the Toronto 'Globe':

"Conservation of Canadian forests, which includes, in Mr. Weldon's opinion, a restriction of the exports of pulpwood, cannot be too greatly emphasized. A cord of pulpwood shipped across the line to a mill in the

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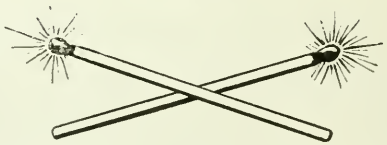

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States does not begin to benefit Canada as much as if that cord of natural product had been kept here for purposes of manufacture. Protection against fire, however, was the main factor to-day in conservation. "We will gain more to-day by preserving our forests from fire than by reforestration," was the way Mr. Weldon expressed himself. "After all, fire is destroying more timber than the lumberman is taking out, and if efforts are concentrated on stopping this waste by an improved system of fire-ranging the country will be greatly benefited and enriched in the days to come."

The future of Canada in the paper industry is unlimited. "In ten years," he said, "I venture to say that all the newsprint in America will be manufactured on this side of the line. We have in Canada unlimited quantities of wood and an abundance of water and water-power. This country owns 10 per cent. of the world's supply of pulpwood, and yet we are producing only about five per cent. of the world's paper. The United States has eighteen per cent. of the world's pulpwood supply, and makes about forty-two per cent. of the paper. There is only one conclusion to such a situation." The big development, Mr. Weldon thinks, will be in newsprint, which offers the greatest opportunity to Canada for expansion. The scene of development in the immediate future, he thinks, is bound to be in territory lying directly south and east of Hudson's Bay.

# NEW METHODS NEEDED TO SUSTAIN FOREST PRODUCTIVENESS

## An Instructive Survey of Present Forest Management as Shown in Everyday Commercial Operations

*(Excerpts from an Address by Ellwood Wilson, F.E., before Technical Section of the Canadian Pulp and Paper Association)*

Our forests have been treated like mines from which we expected to draw all the raw material we wanted and if we ever gave the matter of their exhaustion a thought it was to say, "well the young trees are growing up all the time to replace those we cut." Unfortunately this is not the case for in a virgin forest the trees of different species which make up the stand have reached a state of equilibrium where the growth is balanced by the death and decay. On cut over lands, the shallow rooted spruce and balsam trees after being thinned out blow down in large quantities, the letting in of a large amount of light gives the hardwoods an opportunity of which they quickly avail themselves, to seed in, and the young hardwoods grow up so quickly that they crowd out the softwoods. In our examinations of cut over lands we find that if left to grow for thirty years they will not yield more than three cords per acre which will make the cost of cutting them very high.

In Europe more than 100 years ago the same conditions that exist on this continent to-day confronted the people and after much experiment and many failures they learned how to look after their forests and we have the benefit of their experience. If we are wise we shall take warning and follow their example and adapting their knowledge to our different conditions we will take time by the fore lock.

### *Stocktaking Needed.*

Already there is anxiety in the United States about the supply of pulpwood for the future and many firms are drawing on Canada and others have already provided them-

selves with large areas of our timber lands. The pulp and paper industry has grown by leaps and bounds and with the increasing uses to which wood pulp is put and the growing demand for it, we should take careful stock of our resources and utilize them wisely and with an eye to the future. A pulp or paper mill can not be taken down like a portable saw-mill and moved from one place to another as the supply of timber is exhausted, millions of capital are invested and only by long term operation can it be made to pay.

I do not wish to be taken for an alarmist and I am far from pessimistic but I do think it is time for us to stop guessing about the amount of timber we have, and to face the facts, make a careful inventory and utilize our forests intelligently. My own conclusions are based on facts, carefully ascertained.

*Why Costs Increase.*

The question of accessibility of wood supplies plays an important role in the cost of raw material, in the case of wood, the extra expense of taking men into the woods long distances, of transporting provisions first by rail then by sleighs and the long drives on the rivers all add to the cost per ton of paper. This difficulty has been aggravated by our methods of logging. At first all the timber was cut off around the lakes and along the rivers for say a half a mile and this was gradually extended until the haul became too long to be economically possible. Also timber in difficult places was left. The usual method of logging which is still in force nearly everywhere in Quebec is to let a contract in a predetermined district to a jobber for a certain number of thousand logs. The number of logs that can be cut is guessed at and is finally settled by compromise with the jobber. Usually there is more than enough timber in the district assigned him and he proceeds to lay out his roads radiating from his headquarters and to cut as close to these roads as possible often leaving quite large amounts of timber between them, which necessitates going back to this same section again and as the timber left is the most difficult to get out a higher price must be paid.

Unfortunately, until within the last six years the river drivers invariably set fire to the slashings in the spring and burnt off the timber, so that one could not go back at all. The course of practically every drivable stream is burnt and I estimate that about 30 p. c. of the St. Maurice Valley has been burnt over in the last fifty years and about 16 p. c. of this area has not yet commenced to reproduce and the balance will not produce a crop for many years.

*Composition of Forests.*

The condition of the forests is a matter about which the average man does not have any very clear ideas. In the first place we have very little forest which is composed of just one species. In swampy places we have pure stands of black spruce, growing thickly, hardly ever attaining a larger size than ten inches and most of the trees of great age owing to the unfavorable conditions of growth. I have often seen trees five inches in diameter over one hundred years old. Then on sandy plains we have dense stands of jack pine which has usually come up after a fire and which is so crowded that the trees are very tall and spindling and will never reach commercial size. On large areas too, over which fire has passed we have stands of aspen and white birch neither of which trees growing under such conditions have much merchantable value as they seldom reach large size, are generally diseased and comparatively short lived. Our really good forests are composed generally of balsam 61 p. c., white birch 17 p.c., white spruce 15 p.c., black spruce 4 p.c., maple 2 p.c., cedar .5 p.c., other hardwoods .45 p.c. and white pine .05 p.c. Of this about 32 p.c. of the total stand spruce and balsam can be cut above the Government diameter limit. The way the cutting has been carried on in the past most of the white and black spruce and some of the balsam has been taken off. Where a good deal of light has been let in and conditions were otherwise favorable the balsam has come up in dense groups in which

the struggle for existence is so great that the trees rapidly become diseased and the resulting stand is of small value. Where the conditions are more favorable for hardwood reproduction these trees seed in thickly and make it very difficult to obtain reproduction of softwoods. Our present methods of cuttings are slowly but surely turning our forests from coniferous to hardwood ones and the coniferous will have a difficult time to re-assert their supremacy over the broad leaved trees. We are leaving the whole matter to chance and unquestionably our forests are deteriorating. The leaving of the debris from lumbering not only increases the fire hazard but provides ideal conditions for the growth of harmful insects and fungi. It is in a sense like leaving unburied corpses in a community.

*Science in Logging.*

Now the aim of the forester is to regulate all these matters. The proper cutting of a forest, unless it is cut clean, is a matter which requires experience and above all, good judgment, the balance is delicate and the result of a wrong system of cutting often take very many years to correct. The ideal at which we aim is to make every acre bear as many trees as it will carry of the most useful sorts for


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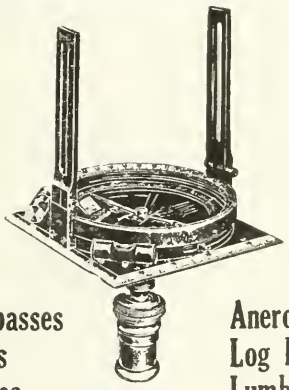

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the purpose in view and to keep up a sustained yield. This may mean that more trees must be left than under the present system with a slight increase in present logging expenses but a large decrease the expense in future operations. In changing over from an unregulated to a regulated forest the expenses for logging will be larger for the first felling but thereafter should gradually decrease as the stand of merchantable timber increases.

We also want to utilize every possible tree. At present we have a large amount of hardwood which is left in the woods and as I have said before hinders the growth of the coniferous trees. It is quite possible to use this for pulp with the soda or sulphate processes but I understand that it cannot be utilized with the sulphite process. I visited a mill in Austria which used beech entirely and made a good quality of pulp. There is, it seems to me, no reason why hardwood should not be used for ground wood; the fibre is, of course, shorter, but it ought to make a good filler. The objections are that it is difficult to float and some difficulty might be encountered in barking it. The first difficulty can be overcome by spring cutting and the second might be overcome by peeling in the woods as is done with poplar. This would lengthen the time over which our supply of spruce and balsam would last and add much to the value of our timber limits. The Laurentide Company in co-operation with the Forest Products Laboratories hopes to try some experiments along these lines this winter.

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Then there is the elimination of logging wastes which are at present larger than they should be. The lumber companies usually take logs from a tree until a diameter of six inches is reached but the pulp companies take down to four inches. However, a very bad custom still holds of using logs thirteen and one half feet long and as it is often impossible to get a log that length out of a tree top much good wood is wasted. We have measured up over two thousand tops and we find that in the St. Maurice Valley about 31,000 cords of wood are wasted each

season. Then too stumps are cut far higher than is necessary and the waste from this source approximates 10,000 cords per annum. A large amount of good pulp wood is wasted in building camps for the men and much is still used for roads although this last waste has been much reduced.

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the stump to the mill doing away with our huge wood piles, with the expense of piling and unpiling, the loss of interest, the deterioration of the wood and the danger from fire. With our timber areas concentrated the expense of fire protection and administration would be much reduced and labor afforded for a large number of men. Owing to the much larger amount of wood per acre the logging costs would be much reduced and as only the best trees would be allowed to reach maturity the quality of the wood would be much improved. We would have a steady supply for all time and a uniform cost figure and by having our forests near the mill means could be devised to use up the branches and probably even the needles so that like the packing industry which uses everything of the hog but the squeal, we could use all of the tree but the smell.

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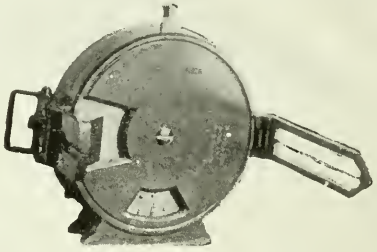

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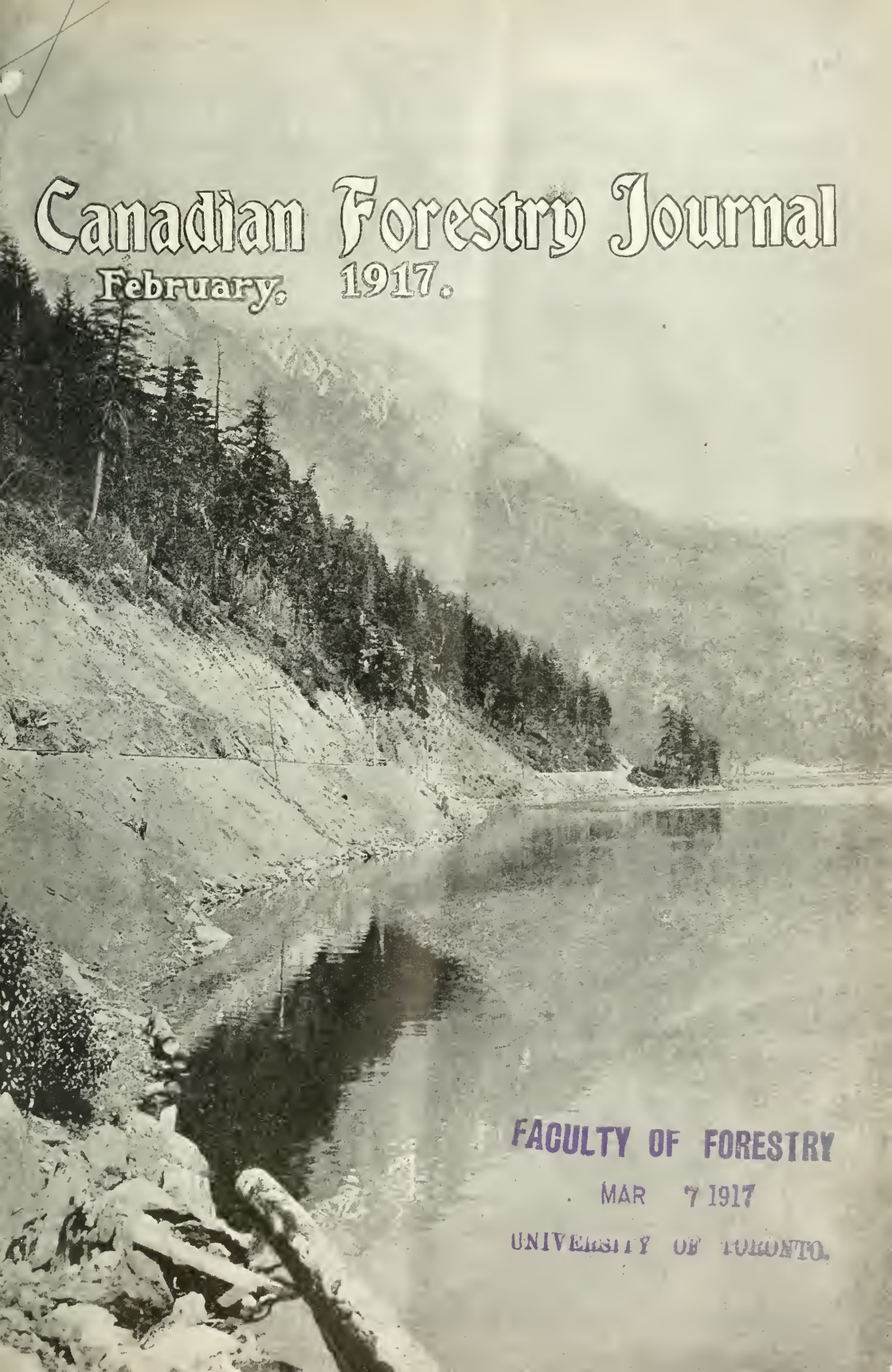

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A STRIKING ILLUSTRATION OF THE WRECKAGE OF TREE LIFE BY ARTILLERY FIRE.

Photograph Taken on the Bank of The Yser.

# Improving the Farmer's Trees

## How Straggling Growth can be Easily Developed Into Marketable Timber by Careful Pruning.

*By B. R. Morton, B. Sc. F., Dominion Forestry Branch, Ottawa*

On many farms, especially in the more outlying agricultural districts of Eastern Canada, are to be found patches of uncultivated clearings. These are areas which are too stony or shallow for plowing or they are situated on hillsides too steep to be profitably worked. They have, therefore, been lying abandoned or neglected for many years and a growth of young pine, spruce, balsam, fir or cedar has sprung up on them. This new growth has originated from windblown seed of neighboring stands or from a few trees which have escaped the axe during the clearings. This growth should be encouraged since it occupies land unsuited for cultivating. In places the growth may be quite dense and if permitted to come ahead will soon be sufficiently crowded to produce desirable clear straight timber. On other areas, however, especially on those at some distance from the seed trees, the growth will be found very open and scattered. The trees are so far apart that their branches will never meet to form a close stand or at least not until the trees have reached a large size.

### *Planting Recommended.*

Where the trees are still small, two or three feet high, the proper density for producing good material may be obtained by artificial seeding or planting among them. Or it may happen that an exceptionally good seed crop will bring about a thickening of the new stand. Seed years are uncertain, however, and planting is recommended except under very favorable circumstances.

In many such open stands, however, the trees have reached the height of 10 to 15 feet or more and are now too far advanced to be overtaken and effectively crowded by any later growth that may come in, either naturally or artificially. Growing under these open conditions the trees will always remain branchy and when cut will produce only inferior material since every branch which has been allowed to develop on the main portion of the trunk will result in one or more knots in the lumber. The strength and value of the material is thereby greatly reduced.

### *How to Prune.*

It is apparent then that if these larger open-grown trees are to produce valuable timber they must be artificially pruned. The following plan is suggested. The pruning should begin, if possible, before the lower branches have died or become over one-half an inch in diameter and before the trunk is over four inches in diameter at stump height. In order that best results may be obtained, the branches must be cut off right at the trunk. No projecting stubs must be left. To leave long stubs will obviously have the same effect as leaving branches. They become imbedded in the body of the tree as the new wood is formed around them and the result is a loose knot in the sawn timber.

### *Leave Heavy Top.*

The branches should not be removed too many at a time. They should be cut gradually, that is, two

or three of the lowest branches to be taken off every three or four years. The top or green portion of the tree should always be maintained not less than one-half to one-third of the total height of the tree. If too little top is left the growth of the tree is seriously retarded. No more green branches are removed after the trunk has been cleared to the height of 19 feet above the ground, since the object is to produce only one sound clear 18 foot log per tree above the one foot allowed for stump height. The branches above the 19 foot mark are left to flourish and extend as they will, until such time as the trunk may have reached the diameter required by the owner and the tree is finally cut down.

*The Cost Per Tree.*

This is a simple method of obtaining good material from trees which would otherwise produce little better than fence posts or firewood. It is not a costly method when one considers that the work can be done during the winter when there is comparatively little work being done on the farm. The total value of the labor when the pruning has been completed would probably not amount to more than 10 to 15 cents per tree.

Removing the branches above the nineteen foot mark is not recommended largely because it necessitates a ladder of such length and weight being used, that it cannot be readily handled by one man. Another reason for not removing the green branches above the first log length is the fact that the greater the green top a tree has the more rapid is its trunk diameter growth. To reduce the size of the top further would mean the lengthening of the time required to produce merchantable sized material.

---

**Lumber For Belgium.**

Professor Albert van Hecke, of the University of Louvain, Louvain, Belgium, is in America to study the most suitable lumber for the re-building of Belgium after the war.

---

SPRUCE AND BALSAM COMING IN ON AN OLD CLEARING.

Unless This Stand Becomes Thicker, Much of the Timber Will be of Inferior Quality.

A CLASS ROOM IN THE OPEN.

# A Children's School in the Forest

## Remarkable Results in Improved Bodies and Minds Achieved by the Toronto Board of Education.

*Since the followiny description was written by Dr. W. E. Struthers, Chief Medical Officer of the Toronto Board of Education, the School has developed substantially. There are now two Institutions, placed in Victoria and High Parks.*

Nothing in the modern development of the public school has given more satisfaction than the "Forest School." From everywhere comes the report of the remarkable mental stimulus received by the child in its outdoor life, and the great improvement in its physical development. Such schools have proved to be an economy, not an expense. Children accomplish in half the school lesson-hours as much as their stronger fellows n the regular school. The other half of the lesson periods are given to nature study, play, gymnatic exercises and drill. Children are given three wholesome. meals a day, plenty of milk, and two hours' absolute rest and sleep every day. Such regularity of life in work, play, meals, and rest produces remarkable results in a very short time. I beg to report our own experience in Victoria Park last summer, with its most encouraging results. The Forest School opened on June 20th, and closed Sept. 20th. In all about seventy children were in attendance; the average daily attendance, however, fell somewhat below fifty, and in 1916 was 100. In this tentative effort to demonstrate the value of such open-air school work, the value of such open-air school work, we have had, of course, some difficulties, and a number of handicaps. The children had to learn that

although the school was in the woods, that although the method of teaching and studying was so different, it was still necessary to maintain discipline. Some of them did not seem to know what obedience meant. Many were under the impression that this was not a regular school in any sense, that even in attendance they could come and go as they pleased. In many ways, too, our facilities were limited, and, of course, our difficulties to provide and care for the children increased. The unusual amount of wet weather at this season of the year was also a somewhat serious handicap, because our facilities for shelter were limited.

*Ten Hours in The Air.*

During fair weather the children spent ten hours in the open. They usually arrived at the grounds about 8.30 a.m. and left for home about 6.30 p.m. After a breakfast of cereal, milk, bread and butter, the nurse took charge of one class. They were divided into junior and senior classes. At 10.30 they were served with a glass of milk and bread and butter. At 12 o'clock there was a general wash-up. Dinner consisted of soup, potatoes, and meat, bread and butter, milk and some kind of pudding. Supper consisted of bread and butter, jam, light cake or oatmeal cakes, or bread and milk, etc. After each meal each child took its own cup, with some water, and under the watchful eye of the nurse thoroughly cleansed its mouth and teeth. At one o'clock came the rest period; all were required to go to sleep for two hours. The cots provided by the Board were much more satisfactory than the camp, or reclining chair, which is almost universally used elsewhere. The cots 5 feet long and 3 feet wide, had woven wire springs and drop ends, so that they were easily handled. A single military blanket and a small pillow completed this equipment. These were numbered and each child looked after its own blanket and pillow under the supervision of the teacher and the nurse. These cots allowed complete relaxation of the body so that the children's sleep was sound and refreshing.

*Rebellion at First.*

The first two or three days the children thought this was a horrible imposition; but in a very few days every little pair of eyes closed naturally and readily without protest or murmur. After the rest period came another study period, and then play period. Finally the march through the woods to catch the car home at 6.30. Besides the school work taken up by the teacher, the nurse instructed the children in the use of the tooth brush and care of the teeth; gave health talks on cleanliness, care of the body, ventilation, wholesome food, manners and deportment; gave breathing exercises, nature talks as they rambled in the woods or on the beach, etc. Every day, also, a certain number had to take a tub bath.

*Examined by Doctors.*

All of them were examined by the School Medical Inspectors before being selected. The Dental Inspector examined 58 children in attendance and reported many mouths in very poor condition, with abscesses, inflammed gums, and decayed teeth. All children were provided with a tooth brush, and after each meal the nurse put them through the tooth brush drill. Every child was thoroughly instructed in the use of the tooth brush, and made to use it. The Dental Inspector, removed jagged roots, and stain and tartar from the teeth. At the closing of the school he was able to report as follows: "I wish to draw your atten-

WHERE SOME OF THE PUPILS COME FROM.

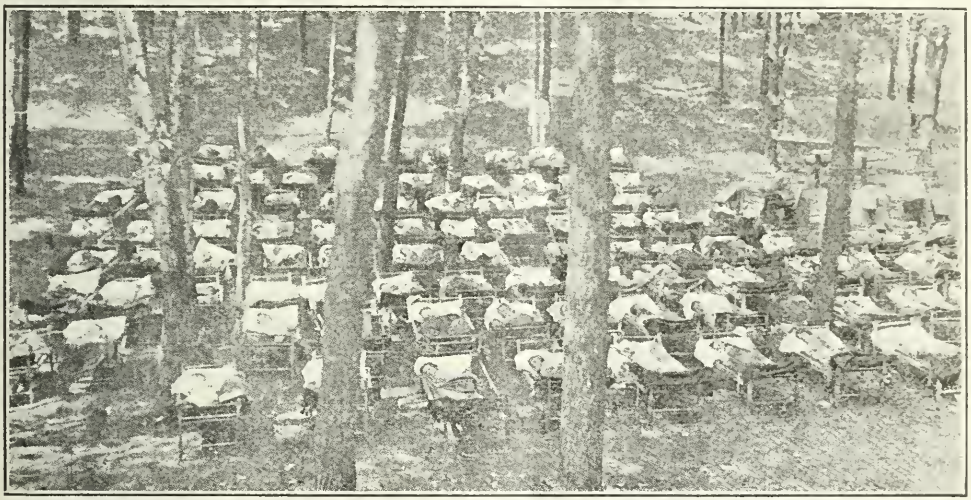
tion to the beneficial results of the regular and careful brushing of the teeth by the children under the Nurse-teeth by the children under the Nurse's guidance. At the close of the school the mouths of these pupils were practically in every case models of cleanliness. If the same regular care that was practiced in the Forest School could be carried out in all our Public Schools it would revolutionize the mouth conditions among children."

*Gain in Weight.*

During the first week the Forest School was open, all but three children gained in weight. The gain varied from one-half to four and a half pounds. Naturally that gain did not continue at the same rate in the weeks to follow. But to judge the benefit accruing to these children from the point of view of the gain in weight only would not be fair. The gain in weight is important, for it should indicate increased vitality and strength. But this is not the only result. Children came to the school dull, stupid, unresponsive, with but little evidence of developing mentality. It was a great pleasure to watch the awakening and quickening intelligence; to see apathy and dullness and stupidity replaced by intelligent alertness and activity; to note the bright eye and quickened movements; to see the natural interest in everything that surrounds a child evidencing a developing mind.

*Teaching Manners.*

But even this quickened mentality is not the only result, for the child has learned something in deportment: to lift his hat to a lady, to smile back "Thank you" for a service rendered, to eat and drink decently at the table, to appreciate the beauty of a few wild flowers, the lure of the open woods, the majesty of the rolling sea, to recognize his Creator in the things of Nature. There has been an uplift to his whole moral being, the effect of which, I believe, will never pass away. I know of nothing that would be a greater blessing to the children of this city, that would do as much to produce and maintain that vigorous physical health so essential to mental development and moral well-being. I know of nothing that will do so much to prevent debility, consumption, and all wasting diseases, that will do as much to restore vitality and produce the physical and mental development that means efficiency and usefulness to the city and to the state. The Forest School means a preventorium; means a wholesome and vigorous body, a quickened and disciplined



REST HOUR IN THE WOODS.

mind, clean and regular habits of life; means health, efficiency, usefulness, independence, content and happiness; means children saved from misery, crime and degradation. In the face of such manifest benefit to child life, and the striking success not only of this tentative effort here, but also of the open-air schools of America, and Europe, it is very desirable that such a type of school should be continued and extended.

## The Forester and the Lumber Company

Mr. J. B. Snowball of the W. B. Snowball Lumber Co. Chatham, N.B. made the following interesting statement at the annual meeting of the Canadian Forestry Association:

"It pays to have a forestry branch in a company the size of ours. It is distinctly a paying proposition and I advise any paper, pulp, or lumber company anxious to operate lands economically to employ a trained forester. We have received an adequate return from our investment already. We are making a considerable saving in cutting and a saving to the Government on stumpage."

The Forester of the W. B. Snowball Company is Mr. J. R. Gareau, a graduate of Laval Forest School, who has had considerable practical experience since graduation.

## Eight Thousand Dollars ! !

Eight thousand dollars were spent on the various educational activities of the Canadian Forestry Association in 1916. It is no exaggeration to say that one hundred dollars of national benefits are returned as dividends on every dollar that leaves the Association treasury.

Considering the great field for educational work and the keen response of the Canadian people to every attempt to enlist their interest and co-operation, eight thousand dollars is meagre enough. The 1917 programme of propagandist work in all parts of Canada cannot be handled on last year's revenues. We appeal to all members to pay their membership fees promptly and to select, if at all possible, the Contributing Fee of five dollars.

Remember! The Canadian Forestry Association has no endowment, and no identification with any Government or commercial interest.

The cause is national. The organization and its methods of operating are expressive of the public spirit of 4500 members. In other words, the Canadian Forestry Association belongs to you and cannot fulfill its purposes without your support.

### Inspected Wood Exhibit.

The Hon. H. C. Brewster, premier of British Columbia, called at the offices of the British Columbia Lumber Commissioner in the Excelsior Life Building, while in Toronto, and inspected the exhibit of forest products there. The shipments of British Columbia lumber to the eastern market during 1916 were many million feet in excess of the preceeding year.

# Vivid Letters from the Front

## Canadian Foresters Now Serving Empire Meet Strange Experiences—From Pigeon Training to Air Photography.

The following extracts from letters received from Canadian foresters, and others in the Dominion forest service, will prove of much interest:—

From Private J. H. Vicars, (Clerk in the office of the Riding Mountain Forest Reserve):

107th Canadians,
Witley Camp, Sussex.

"Logging operations are carried on quite extensively in some parts of this country. I had no idea there was such an amount of good timber. Fir is the predominant species just around here, and the site of the logging operations is certainly an object lesson in economy. Absolutely nothing is wasted. The stumps are cut level with the ground, the branches utilized for kindling wood, and the fine brush is piled and taken away, or is scattered evenly on the ground. I see a large number of logs peeled in the bush, and in this case even the bark is collected and taken away, perhaps to the tannery yards."

From Lieut. J. A. Hutchison, (Forest Assistant, Brazeau Forest):

Royal Flying Corps,
London, December 27.

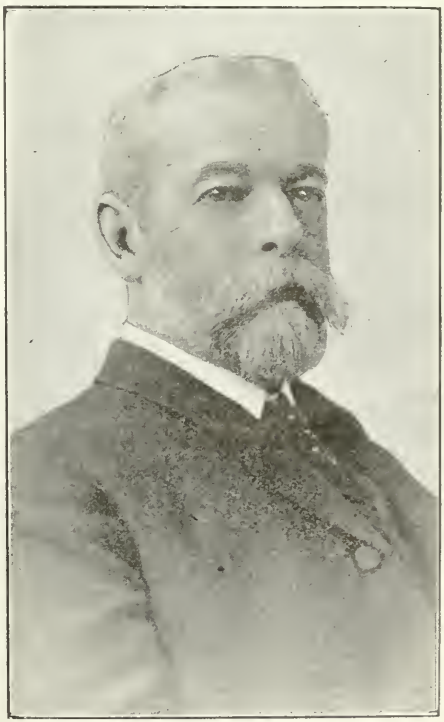
"I have been posted to the 39th Squadron where I get my preliminary flying. Took my first flight yesterday and have almost an hour in now. I like it fine."

From Lieut. J. P. Alexander, (Forest Assistant, Crowsnest Forest):

France, December 11.

"So far out here I have seen none of the Forestry men from Canada, although I heard in England that Charlie Morse was in command of a sawmill somewhere in the country. And I must not forget that W. L. Scandrett and I had dinner together one evening in London and met Mr. Christie, who I believe was in the British Columbia service and is with the Engineers over here. He came over when I did, leaving England on 24th October with an officer's draft. Scandrett has been flying in France now for over six months, and seems to be getting along very well. He was on leave when I saw him.

"For myself I was released from from the 134th Battalion and later came over with the First Officers' Draft from Canada. After a varied career at the Canadian Military School and Pioneer Training Depot in Shorncliffe I was drafted to the 3rd Canadian Pioneer Battalion and have been here ever since.



HON. SYDNEY FISHER
President, Canadian Forestry Association for 1917.

(*Pigeons as Messengers*).

From Private F. B. Robertson, (Forest Assistant, Head Office):

France, December 20.

"The last time the battalion was out I took an interesting pigeon course in connection with signalling. The birds have done great work here in the carrying of messages. I tried to consider how pigeons would work to carry messages from rangers in northern districts to headquarters or wherever the loft was established. The great difficulty is that birds will not "home" properly after being away from the loft more than a couple of days; also, as they would be carried in a small basket, they would become wing bound."

Lieut. W. J. Maclaren (Chief Fire Ranger, Winnipeg):

December 14.

"As you probably know, all the Canadian Forestry battalions have been amalgamated into the Corps known as the "Canadian Forestry Corps," and I am at present attached to the Corps Headquarters in France where we are just commencing operations which will necessitate a large number of both bush and mill men."

*On The Eastern Desert.*

Captain E. W. Conant, (Forest Ranger, Nicola Reserve, B.C.):

Cairo, Egypt, December 15.

"I am now on the Eastern desert facing the Turks instead of on the Western side against the Senussi as we were all the summer. Also my job is rather altered as I am a Captain on the Staff. I have been on the General Staff for a while and am now attached to the Headquarters of a mounted yeomanry Brigade, but I leave them in a few days to go as Brigade Major to some other brigade but which one I don't know yet. The Western desert wasn't a patch on this one for sand. The surface of the former was decently hard and one could use horses and even Ford cars, but here you are about ankle deep all the time and horses cannot go out of a walk; it is all up and down, steep sand dunes, but in nearly every hollow there are date palms and a well of more or less brackish water, fit for animals and native Bedouin but not for white troops, and all our water is brought in pipes from the Suez Canal; and only a gallon a day is allowed per man, for all purposes, so washing goes a bit short. I am very tired of the desert and would give a good deal to be in the woods again. If I come out of the war alive it will take a 17 inch shell to get me out of British Columbia any more."

*Adventures In The Air.*

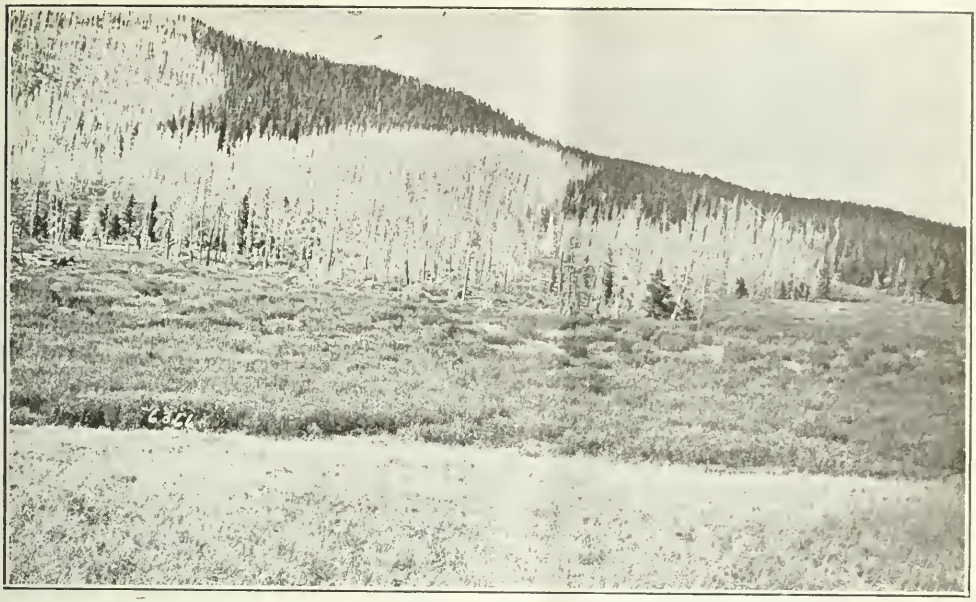
Lieut. W. L. Scandrett, (Forest Supervisor, B.C. Reserves):

France, Nov. 29, 1916.

"I still consider that the honour belongs to the Infantry, not so much because of the danger they must undergo as because of the hardship and discomfort they are called upon to endure. As far as safety is concerned it is a toss-up, I think, because while the infantry only go "over the top" once in a very long while we have to go "over" every time we fly. When I was a new pilot I was only sent up on the defensive jobs which are carried out above or behind our own lines, but now that I am supposed to have developed more or less knowledge of the lines and the habits and customs of the wily Hun I rarely go on a defensive assignment but find myself cruising about well on the other side of the lines, taking photographs or making a reconnaissance.

In July and even more so in August we had things pretty well our own way in the air and the Hun machines did not bother us much. Since then however they have been concentrating here until they are as numerous or more so than we. The result is that we never attempt an offensive job without a swarm of them coming after us.

Not long ago I was sent out with a beautiful new machine to take photographs beyond Bapaume, I had with me as escort three more like myself and ten smaller, fast machines. While well over in the enemy country my escort for some unknown reason cleared out and left me alone. I had been watching seven Hun machines ahead of me and was surprised



A GRAPHIC DELINEATION OF THE DAMAGE CAUSED BY A NEGLECTED CAMP FIRE ON AN ALBERTA SLOPE.
The Changing Wind Currents Caused the Curious Indentations of the Burned Grey Patches Against the Green.

to see them suddenly come at me. I hardly realized what was wrong at first as I still believed my escort was with me. Being alone and almost already surrounded there was nothing for it but to go homewards so I shoved the nose of the machine down till it was going over 100 miles per hour and endeavoured to dispense with the company of the Huns. Three of them succeeded in opening fire at short range however and made a sad mess of my new machine. At the end of half a minute there was patrol splashing everywhere from a punctured tank and several wires were streaming in the wind. When we got home and examined the machine we learned that it had to be almost entirely rebuilt so great was the damage they had inflicted. The only consolation was that we had succeeded in getting most of the photographs.

Photography is now one of the most important branches of the R.F.C. work and its usefulness is amazing. If the Hun is extending his trenches or building new gun emplacements we can keep accurate tab on his progress by means of photos and experts in interpreting the prints can collect most amazing intelligence about the existence of barbed wire, telephone lines, light railways, dugouts, etc. that the layman would miss entirely. Open attacks have been delayed for days at a stretch until photos of certain areas were obtained.

*Photos On The Wing.*

The most useful pictures are taken from above and each plate covers a large area. The Hun on the ground can easily tell when you are taking pictures and favors you with the most persistent attention from his "archie" guns. This is annoying and has been known to be dangerous as you soon find yourself sailing through clouds of black shrapnel smoke and high explosive. "Archie" is what shakes the nerves of the airmen so badly.

Since coming out here in July I find I have slowly worked up the list in seniority, till there are now very few senior to me in the squadron. For some little time lately I have been carrying out the duties of a flight commander which is a captains' job and am now hoping sometime to get the job permanently, preferably in England.

# New Light on Tropical Forests

## Timber Region of Amazon Basin of South America Three Times as Large as U. S. Forest Area.

In announcing a new department of tropical forestry, under Dr. H. N. Whitford, Yale University has provided the following most interesting discussion of opportunities awaiting development in a field practically unknown until very recent years.

The recent development of tropical countries has focussed the attention of the world on their forest resources. The question arises, have such countries extensive forests and if so can these forests be utilized for their industrial development or will they have to depend entirely on the forest regions of Europe and North America for their main timber supplies?

### *Forests of the Tropics*

In North America and Europe there are certain extensive forest regions that at present time furnish the main supplies of timber used in the world. There are at least two very large forest regions in the tropics. These are the Amazon region of South America and the Indo-Malay region of Southeastern Asia and adjacent islands.

The forested region of the Amazon River basin, comprising an area of 1,600,000 square miles is the largest in the world. This is three times as large as the forested area of the United States and 260,000 square miles larger than that of European and Asiatic Russia combined.

The forested area of Borneo, Sumatra, the Philippine Islands, the Malay Peninsula and Burma is roughly estimated to be not less than 500,000 square miles, or nearly as large as that of the United States.

Thus the forested area of these two tropical regions alone comprises more than 2,000,000 square miles.

### *Some Misconceptions*

The popular conception of tropical forests is that they are only capable of producing woods chiefly valuable for cabinet purposes, for dyes and extracts, or for special uses requiring extreme hardness and durability. This is due to the fact that only this class of material can be marketed in temperate regions without competition with native woods and until recently could not be marketed for home consumption because of the high cost of lumbering due to primitive and expensive methods of logging and milling. For example, the Philippines formerly consumed the hard, durable woods mainly, and depended largely on outside sources for cheap construction woods. Investigation showed that the great bulk of the woods of the forests consisted of soft and medium hard woods suitable for the same general construction purposes as Douglas fir, the chief imported wood. Modern methods of logging and milling were introduced and thus the cost of manufacture reduced so that today the Philippines are not only supplying their own wants but are rapidly forging ahead toward becoming an exporting country.

The impetus given to the lumber industry in the Philippine Islands has spread to parts of Borneo and Sumatra where modern methods of lumbering are being introduced.

Recent investigations in South America show that their forests besides containing hard and durable woods, have a much larger percentage of soft and medium hard woods that

can be used for general construction purposes.

*Future of Tropical Forests*

Until tropical countries rich in timber resources can be made to appreciate the value of their own forests and can cheapen the extraction of lumber by the introduction of modern methods of logging and milling, they from necessity will have to depend on outside sources for the construction timbers necessary for their industrial development. When they come to appreciate this condition, they will not only be able to supply their own wants, but furnish timbers for export. Thus the rich forests of the Amazon region are favorably situated to furnish regions like southern Brazil and Argentina that are less favored in natural timber wealth. The forests of northern South America, lying adjacent to the practically deforested regions of the West Indies and Central America, can supply the wants of these countries.

Already Borneo, the Philippines, and Sumatra are gradually increasing their exports to China, a deforested country, to the United States and Europe, and bid fair to break into the Australian markets that are at the present time getting timber from the United States and Europe.

## *New Brunswick's Great Opportunity*

As has been previously pointed out in the Canadian Forestry Journal, New Brunswick is rapidly coming forward as a province of conservation ideals. The work of surveying the provincial forest areas and classifying agricultural lands, so well begun under Premier Clarke, will undoubtedly be continued and developed by the new Cabinet,

Mr. A. E. O'Leary, Chief Game and Fire Warden for the province has submitted his annual report which shows that fires occurred in 1916 over an area of 2357 acres, with a total timber loss of $8695.

Mr. O'Leary makes a thorough recommendation of the system of issuing 'burning permits' for the setting out of all land-clearing fires and quotes the testimonies of Quebec, British Columbia, and some of the American States as to their great success with the permit plan. New Brunswick experimented with the permit plan in two townships, Hazen and Grimmer.

Former-Premier Clarke definitely committed his Government to a reorganization of the New Brunswick forest protection system and in the interests of the province this step should not be delayed. Warden O'Leary, commenting on last summer's fires, between Welsford and Clarendon states that "there is no doubt but that for a heavy rainfall all these fires would have assumed enormous proportions." Again, "part of the area burned had been cut last year and the tree tops which had been piled up in that district afforded great facilities for the spread of the blaze." No forest guarding system can afford to take chances on the good luck of a rain fall. Unless present methods are radically changed in New Brunswick, there is not the slightest guarantee that a period of extended drought in 1917 may not give New Brunswick the unenviable distinction of providing the biggest forest losses of the season. And it will be unusually fortunate if a heavy toll of settlers' lives is not included.

# Canadians and Americans Discuss Problems Together

## Forestry Conference at Washington has Important Results—White Pine Disease the Chief Subject.

The Annual Meeting of the American Forestry Association at Washington, D.C., on January 18 and 19 was attended by a group of Canadians including R. H. Campbell, Director of Forestry, Clyde Leavitt, Forester, Commission of Conservation; Ellwood Wilson, Forester of the Laurentide Co.; G. C. Piche, Forester of Quebec; E. J. Zavitz, Forester of Ontario; P. Z. Caverhill, Forester of New Brunswick; Avila Bedard, George Maheux, G. A. Gutches, Robson Black, Secretary of Canadian Forestry Association, and others.

### *Canada Heard From.*

Three important subjects were on the programme: "Recreational Uses of National Forests and National Parks"; "The White Pine Blister Disease"; and "Stopping Importation of Tree and Plant Pests." While each subject attracted deep interest and received most able discussion, it is probable that the amount of public alarm incident to the white pine menace made most listeners particularly receptive to the papers dealing with the Blister Rust. The subject was treated from the point of view of territories affected, Mr. Clyde Leavitt speaking for Canada, W. P. Wharton for New England, J. B. White for Hudson to Mississippi, and E. T. Allen for the Pacific Coast. Mr. Leavitt estimated the value of Canadian white pine at upwards of two-hundred millions of dollars. He told of the location of known infections, the danger of a spread into the commercial pine areas, and described the efforts to hold the damage to the smallest possible proportions. Mr. S. T. Detwiler, U.S. Forest Pathologist, estimated the value of currant and gooseberry bushes in all of the United States at 48 million dollars; the stumpage value of white pine was seven to ten times that amount. There were 11 million dollars worth of the ribes in the States thus far infected with Blister Rust whereas in the same territory the annual value of white pine cut was between 40 and 50 million dollars.

### *Guided By Local Evidence.*

Mr. C. R. Pettis, Superintendent of Forests for New York States said that there were 10 million white pine in the nurseries of his state and it was not proposed to burn them all up. He had found a large area of the Adirondacks where no currants or gooseberries grew and proposed to plant that section in white pine, despite the alarm over disease. He preferred to be guided by local conditions in selecting trees for planting, and objected to disrupting the whole reforesting movement by a generalized condemnation of white pine planting.

The meetings during the two days were conducted by President Charles Lathrop Pack with remarkable success. The year's work of the American Forestry Association once more testified to the skillful guidance of Mr. Percival S. Ridsdale, Executive Secretary.

The following Resolutions have particular interest for Canadians, Mr. R. H. Campbell, Ottawa, having acted as a member of the Resolutions Committee:

### *To Save White Pine.*

*Whereas*—The Pine Blister threatens to greatly injure the white pine forests of Eastern North America, and is a growing danger to the white pine timber of the West, and its origin, propagation and transmission being now generally understood.

*Resolved*—That it is the sense of this Conference that active measures should be taken by the duly constituted authorities and by all good citizens along the lines advocated by the officials competent to recommend practical measures for preventing the further dissemination and, as far as possible, for the elimination of the disease.

*Resolved*—That immediate action should be taken by the Federal governments of the United States and Canada for adequate quarantine measures to prevent the spread of the disease to sections of the Continent not now known to be infected.

*Resolved*—That co-operation by the Federal governments with States and Provinces to eradicate or control the disease in sections now infected should be continued and extended by liberal appropriations.

*Resolved*—That the States and Provinces, both independently and by Interstate, National and International co-operation, are urged to conduct complete investigations, provide proper quarantines and take all necessary measures, in keeping with the seriousness of the situation, to eradicate or control the pine blister disease.

*Resolved*—That a copy of this resolution be transmitted to the Secretary of Agriculture, to the chairman and members of the United States House and Senate Committee on Agriculture and Forestry, to all members of the United States Senate and to the Governments of the Dominion of Canada and of the Canadian provinces.

*National Quarantine.*

In view of the spread of diseases and insect pests introduced from foreign countries, such as the chestnut blight, gipsy moth and white pine blister.

*Resolved*—That the American Association favor the principle of absolute national quarantine on plants, trees and nursery stock, to take effect at the earliest date which may be found economically expedient.

*Migratory Birds.*

*Resolved*—That the American Forestry Association respectfully urges the present Congress to make effective, through the necessary legislative action, the recently ratified Convention between the United States and Great Britain for the protection of useful migratory birds.

Speedy action is desirable in view of the increasing economic loss to all the people, which must ensue if action be deferred until the next Congress.

## FORESTRY SECTION FOR PULP AND PAPER MEN

Following an impressive address on forestry progress throughout Canada by Mr. Ellwood Wilson, Forester of the Laurentide Company, before the Canadian Pulp and Paper Association at Montreal, Mr. Carl Riordon suggested that a Forestry Section, (similar to the Technical Section already existing) should be organized and set to work. The idea was readily supported by the meeting and the new Forestry Section will presently become one of the chief branches of the Canadian Pulp and Paper Association.

## WILL HELP GUARD N. S. FROM MENACE

Mr. F. A. Harrison, Deputy Commissioner of Crown Lands, Halifax, N.S. writing to the Canadian Forestry Association for a supply of pamphlets on the White pine blister menace, states: "While I feel sure that the disease does not exist here, it is my intention to distribute them to the Forest Rangers so as to have a thorough search made during the coming summer to see if any trace of it can be found."

Many of the large lumber corporations, co-operating with the Canadian Forestry Association, are supplying their woods employees with our illustrated literature on the White Pine Blister with instructions to search carefully for any sign of the trouble.

# The Forest Conference in Montreal

A "Forest Conservation Conference," organized by the St. Maurice Forest Protective Association and the Lower Ottawa Forest Protective Association was held at the Windsor Hotel, Montreal, February 1 and 2. The event was the first of its kind in Canada, and was designed to bring the limit holders, Government officials, foresters, forest protection officers and the public generally into closer touch with present-day methods in fire prevention and fire fighting. That the meetings accomplished this purpose all who attended will agree. The two protective Associations responsible for the programme and the rousing of public interest are entitled to maximum credit. One may not fairly estimate the effects of such conferences by the amount of new information and impulses imparted to the number actually in attendance. That in itself was fully up to expectations. The additional audience of thousands obtained through the generous publicity of the Montreal newspapers can be counted with the gains of this conference.

The addresses covered a wide group of topics, all however being consistent with the purpose of the Conference. Mr. Ellwood Wilson, President of the St. Maurice Forest Protective Association, presided.

The programme included the following:

Opening Address.—Mr. Ellwood Wilson, President—St. Maurice Forest Protective Association.

Address.—Hon. Jules Allard, Minister of Lands and Forest Quebec.

### PROTECTION AGAINST RAILWAY FIRES.

Address.—Mr. Clyde Leavitt,—Chief Fire Inspector to the Board of Railway Commissioners Canada.

Address.—Mr. B. M. Winegar,—Forester Eastern Lines, Canadian Pacific Railway.

### GOVERNMENT FOREST PROTECTION.

Address.—Mr. E. J. Zavitz,—Chief Forester of Ontario.

Address.—Mr. W. G. Howard,—Assistant Sup't. New York State Forest.

Address.—Mr. W. C. J. Hall,—Sup't. Forest Protection Branch, Quebec.

### CO-OPERATIVE FOREST PROTECTION.

Address.—Mr. E. T. Allen,—Forester to Western Forestry and Conservation Association.

Address.—Mr. A. H. Graham,—Chief Fire Inspector to The Lower Ottawa Forest Protective Association.

### THE PROBLEM OF BRUSH DISPOSAL.

Address.—Mr. R. H. Campbell,—Director Dominion Forestry Branch.

### PROTECTION AGAINST INSECTS.

Address.—Mr. J. M. Swaine,—Dominion Etymologist.

### WHITE PINE BLISTER RUST.

Address.—Mr. H. T. Gussow,—Dominion Botanist.

Address.—Mr. G. C. Piche,—Chief Forester of Quebec.

### MECHANICAL AID FOR FIRE FIGHTING.

Address.—Mr. H. C. Johnson,—Fire Inspector Board of Railway Commissioners for Canada.

### TELEPHONE FOR FOREST PROTECTION.

Address.—Mr. R. T. Campbell,—Northern Electric Company.

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Some of the above papers will appear in forthcoming issues of the Canadian Forestry Journal.

SHADED ROADWAYS LIKE THIS GIVE ONTARIO SOME OF THE MOST BEAUTIFUL RURAL DISTRICTS IN AMERICA. . .

# Stock Taking on the Public Domain

## New Brunswick is Developing Plans to Guide Settlement and Devise Future Timber Policies.

*By P. Z. Caverhill, Forester of New Brunswick.*

The classification of Crown Lands of New Brunswick is the outcome of a movement that has been growing for a number of years.

The Crown Lands of the Province, consisting of 7¾ million acres, of which 6½ million are under license, is the chief source of provincial revenue, and the value of the lumber industry is second only to agriculture, having at the present time a value in excess of $15,000,000.

Many changes have taken place with the development of this lumber industry. White pine, which during the first half of the 19th century was our important timber tree, the export of this species alone in 1825 being over 400,000 tons of squared timber, has been for years nearly depleted. Hemlock, a few years ago valued only for its bark, is hard to get at $12.00

to $14.00 per M. for the round log. On spruce it was found necessary to reduce the length and diameter limit from 18 ft. by 10 in. to 16 ft. by 9 in. *Thousands of acres of good timber land have been taken up under the pretense of agricultural development, only to be abandoned after desultory attempts at clearing and cultivating, and after the occupant had burned, possibly, thousands of acres of good timber*; these signs of the gradual depletion of forest land led to a movement for definite knowledge of the condition of the public domain, and a classification of the land as to whether it was chiefly suitable for farm or timber.

*Foundations of Agriculture.*

Perhaps one of the most important features of the survey is the classification and delineation of the agricultural lands, the objects being to direct future settlement to localities where there is the greatest opportunity for successful farming, and to prevent the denuding of purely timber land under the guise of clearing for agricultural purposes.

The success or failure of any agricultural community depends on four factors:

1st, Climate; 2nd, Soil; 3rd, Personal; 4th, Social. We shall consider the first and second in more detail: Climate—The climate in New Brunswick is generally favorable to agricultural pursuits; the winters, though long and severe, are followed by warm, pleasant summers with plenty of rainfall; vegetation showing a remarkably fast development, although late spring and early fall frost limits the range of field crops to those developing and maturing in a little over three months.

Soil—The soil is the factor with which this survey is chiefly concerned, and is, next to climate, the most important in limiting agricultural development. In the classification of soils on an agricultural basis two primary things have to be considered.

1st, Topographical Character.

Soil on gentle slopes or up to a sustained slope of eight to ten per cent. is tillable; slopes to fifteen or twenty per cent. are suitable for grazing. Steeper slopes, soils broken by ledges or boulders are unsuitable for any agricultural development.

2nd, Physical Character of the Soil.

The physical character of the soil determines its moisture and fertility holding capacity, as well as to a large extent the cost of bringing area under crop, and it is more important than soil fertility, because fertility may be increased or destroyed by the manner in which the clearing and cropping is done, but the texture of the soil cannot be changed.

We have divided our soil into five types on this physical basis. They are: clays, clay loams, sandy loams, sand soils and swamp soils.

Roughly speaking, therefore (referring to our soil maps), clay loam, clay soils and sandy loams can be classified as agricultural land, unless there are excessive quantities of surface or sub-surface tone (shown by hatching), or the cost of drainage is excessive.

*Value of The Survey.*

Just a word as to the use the information gathered will be to the department in the future management of the Crown Lands.

1st, It gives definite information of the quantity, quality and value of the timber on any area, from which a very close appraisal of the stumpage can be ascertained: will show whether the Department is receiving full value for the lumber cut or not, and they can adjust their stumpage rates accordingly.

It will show the quantity and quality of species now of little importance because of lack of market demand, and it is hoped that we will be able either to show that these species can be marketed profitably, or to induce industries utilizing these inferior species, where the quantity justifies it, to locate within the province, thus profitably utilizing material which is at present going to waste.

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Mr. W. B. Campbell, B.Sc., of the Forest Products Laboratories of Canada, Montreal, was some time ago

recalled from the front, where he did a large amount of chemical engineering work in gas defence. Mr. Campbell recently lectured before the Canadian Society of Civil Engineers on "Gas Defence and Attack at the Front." The Laboratories have now six of their staff on the fighting line, and have lost one member by death there.

## Settling Soldiers in New Ontario

Toronto, Feb. 8.—In a memorandum to Sir Robert Borden with reference to facilities for settling returned soldiers on the land, Hon. G. Howard Ferguson explains Ontario's proposals, some of which may be mentioned. Farms containing not more than eighty acres will be laid out in such a manner as to bring the different farm houses as close together as possible.

As soon as a soldier desires to go upon a farm and work for himself an eighty acre lot with a ten acre clearing will be allotted to him.

The eighty acres with ten acres of clearing will be given the settler free of charge. For each day's work that is done from the time he enters the training school at Monteith until he goes upon his clearing he will be paid a reasonable wage.

An advance up to $500 will be made to cover the cost of stock, implements and equipment and any assistance in building that may be given for which a lien will be taken against the settler's holding and chattels.

The lien would be payable in 20 years at six per cent., but no payment on account of either principal or interest shall be required until after the expiration of three years.

At the expiration of five years from the settler locating upon his land, and upon the due performance of certain conditions in the meantime, he will be entitled to receive a patent from the Crown.

There are also facilities for co-operative marketing.

## To Re-Establish Allies' Forests

*"The Gardeners' Chronicle," January 13th, 1917.*

The Royal English Arboricultural Society are co-operating with the Agricultural Relief of Allies' Fund in inquiring whether it is possible to render help to our Allies in reinstating the woods and forests which have been destroyed. Inquiries made in France, Belgium and Serbia show that the tree of the greatest value is the Scotch pine (pinus sylvestris) which readily adapts itself to varying soil and climate. Large quantities of these trees are now being cut in Scotland, and it is a comparatively simple matter to save and store the cones for the distribution of the seed required. The cones are rapidly approaching the stage most suitable for the purpose, as later on they swell and the seed is disseminated by the winds. The Serbian Government has asked for 4000 pounds of this seed, which they can immediately utilize, and the French Minister of Waters and Forests has outlined a scheme asking for a supply of seed for the coming spring to be followed next autumn by a further quantity and later on by a supply of young plants of oak, beech, pine, etc. *It is possible also that the rich forests of Douglas pine in Canada may be drawn upon by the Canadian Branch of the Allies' Committee in order to contribute their quota to what would form a permanent memorial of British sympathy.*

# Developing Plan to Oust Patronage

Dr. Adam Shortt, Civil Service Commissioner, has returned to Ottawa from British Columbia whither he went at the request of the newly-formed provincial government to afford the ministers the benefit of his knowledge and experience in matters of civil service organization. The trip was taken at the special invitation and urgent request of Premier Brewster and with the consent of the Dominion government.

Not only did Dr. Shortt consult with Hon. Mr. Brewster but he attended meetings at which all the ministers were present that he might get from them a knowledge of the local conditions as affecting the several departments. On the basis of this knowledge he drafted a bill which, it is expected, will be introduced in the Legislature at the forthcoming session. Two main features of this measure may be mentioned. The first is that the distinction between the inside and outside services will be done away with and the one proposed law will cover both. The second is that there will be one Civil Service Commissioner whose tenure of office will be unaffected by political party changes and who will be given wide powers in the administration of the system. Appointment and promotion by merit will be of the essence of the new law, and if rigidly adhered to, the Forest Service of the British Columbia Government will be placed on a much more efficient basis than has been possible under the patronage system.

# The Ranger at Work

"The fire ranger's duty is first of all to prevent forest fires, and, when they do occur, to put them out. One great feature of fire prevention is the ability of the ranger to educate the people in his district and make them understand the great cause that we are working for.

In dry weather he should always be on the move, watching fishermen, drivers, jobbers and other people travelling in the woods. Whenever he meets a person, he should find out his name and destination, give him advice when needed, and always warn him against the danger of forest fires. By giving the people kind advice and help, he will make them his friends and they will be more willing to do their share in saving our forests.

In the settled districts, the rangers also supervise the burning of slash. The clearing of land is one of the worst menaces to the forest. In former years when the settler wanted to clear his land, he put fire to the brush on his lot, regardless of time and weather. That millions of dollars worth of good timber went up in smoke mattered little to him if it could save him a few days' labour in piling the brush before, and watching it while it was burning.

Damp and rainy weather does not give the ranger a vacation as many people would believe. He then starts cutting and clearing portages and trails to facilitate communications, so that, when fires occur, he can get men and supplies to the fire in the easiest way and the shortest time possible. He also builds look-out towers on high and convenient sites in his district during wet seasons. At convenient places in his district are stored shovels, mattocks, axes, fire pails, etc., for fighting fires."

(Henry Sorgius, Manager St. Maurice Forest Protective Association at annual meeting, Commission of Conservation.)

## FORESTERS ON ACTIVE SERVICE.

Lieut. E. W. Conant (formerly Forest Ranger on the Nicola Forest Reserve, B.C.) has been promoted and is now Staff Captain, 6th Mounted Brigade, E.E.F.

Major Lyndon, (formerly Forest Ranger on the Crowsnest) wrote on the 6th January from the Canadian Garrison Duty Depot, Hastings, Sussex, stating that he returned there from France the end of October and has been doing garrison duty, but expects to go back to the front the end of February or early in March.

Mr. H. C. B. Smith, who was clerk in the British Columbia Inspection office, and is now with the Canadian Cavalry Brigade in France, writes that he had ten days' leave at Christmas so was able to spend it in England. He says: "The Old Country looks pretty good to one after fourteen months in the Somme country."

Mr. C. H. Morse, formerly Assistant to the District Inspector for Alberta, who is with the Canadian Forestry Corps in England, writes: from Virginia Water, England:

"The work of the Forestry Corps seems to be extending all the time. At present there are only three battalions, the 224th, the 238th and the 242nd, but more are evidently on the way as a large base camp is being prepared in Windsor Park about two miles from Virginia Water. Yesterday a Medical Board came along to re-grade all our men and officers. To-day General Turner was here and told us that all the physically fit men were to go to the trenches. My work here as officer in charge of the woods operation is rather a good experience but the work is simply logging. The name Forestry Corps is a misnomer. We even leave slash in as bad shape as I have ever seen in Canada. Everything is utilized however. Stumps are cut very low and tops are used for firewood and pit props. We have done some burning but not with bushmen. Their skill is valuable and they must be kept on production. We have used mechanics from the R.F.C. but it takes ten of them to do a good Canadian day's work for one man."

## RAILWAY FIRES

On all lines subject to the jurisdiction of the Dominion Railway Commission throughout Canada, the fires in forest sections definitely attributable to railway agencies did damage amounting to only $35,567—a remarkably good showing, considering the unfavorable weather conditions.

Of all fires reported, the causes were as follows: Locomotives, 61 per cent.; railway employees, 8 per cent.; campers and travellers, 7 per cent.; settlers, 8 per cent.; other known causes, 3 per cent.; unknown causes, 13 per cent."

## M. A. GRAINGER, CHIEF FORESTER OF B. C.

The appointment of M. A. Grainger as chief Forester of British Columbia, in succession to H. R. MacMillan, now Assistant Manager of the Victoria Lumber and Manufacturing Company, Chemainus, B.C. has been gratifying to all concerned in the welfare of that province. In advancing Mr. Grainger, Premier Brewster has carried out to the letter his pre-election pledges for the abolition of the "Patronage" plan in Civil Service appointments. Mr. Grainger's appointment is most popular with members of the British Columbia Forest Branch and his administration of the complex duties of his new office will undoubtedly reflect the same public devotion as has distinguished his previous career.

When Mr. MacMillan, two years ago, was selected to act as special trade Commissioner for the Federal Government, a task which took him about the world with the object of studying world market conditions

from the standpoint of the British Columbia lumber supply, Mr. Grainger assumed the direction of the work of the forest branch and has been carrying it out ever since.

*In The Klondike.*

Mr. Grainger, who is an Englishman by birth and a graduate of King's College, Cambridge, having been twenty-first wrangler in mathematics in 1896, came to Canada the next year and participated in the famous gold stampede to the Klondike. There he engaged in hydraulic mining. When the South African war broke out he returned to England and enlisted as a private in Roberts' Horse and served throughout the war. He possesses the South African medal with six bars.

After the war he returned to British Columbia where he spent some years in the mining and lumbering industries finding time to contribute a number of articles to Old Country papers and also to write an interesting book, "Woodsmen of the West," a work which accurately depicted life in the lumber camps and described the vast forest wealth of this Province.

*Investigation Work.*

As secretary of the Forestry Commission which investigated the conditions of the industry and the extent of the forest areas of the Province, Mr. Grainger rendered valuable services, the illuminating tables incorporated with that report being special features of the report. In fact to a great extent the value of the reports issued from time to time by the forest branch are due to his great insight into the industry and his mathematical knowledge.

In the legislation which has been drafted relating to the lumber industry Mr. Grainger has taken a leading part; he played a very important part in the organization of the branch which aimed to be one composed of men technically competent and to-day the British Columbia forest branch is recognized as the best in Canada and its status has on more than one occasion been recognized by the other provinces which have framed their own departments on similar lines.

When the organization of the branch was completed Mr. Grainger was appointed assistant chief forester in charge of the record office, a position he held until appointed as acting chief forester.

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"Undoubtedly," remarks the Victoria "Colonist," "no more popular appointment could have been made by the minister and there are a host of Victorians who will wish him every success in his new office."

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**Gerard Power Again Mayor.**

Mr. W. Gerard Power, managing director of the River Ouelle Pulp and Lumber Company, St. Pacome, P.Q., and a devoted friend of the conservation movement, has been honored by the citizens of St. Pacome, by being elected as their mayor several years in succession. "Throughout his wide acquaintanceship in the lumber business Mr. Power has a reputation for successful management and for high business ideals which cannot be excelled," says 'Canada Lumberman.' "The result is that the business of his company is one of the best known in the province of Quebec and one of the most progressive.

Realizing how fortunate they were in having Mr. Power to look after their municipal affairs the people of St. Pacome have again entrusted him with the duties of mayor, having elected him for the year 1917. Mr. W. Gerard Power is a son of Mr. Wm. Power, M.P., of Quebec, P.Q., who is known to lumbermen throughout eastern Canada and in Great Britain, as a member of the firm of W. & J. Sharples Regd., one of the most important and successful firms of lumber exporters in eastern Canada, Mr. W. Gerard Power, therefore, comes by his ability as a lumberman honestly. Three of Mr. Power's brothers have taken their share in protecting Great Britain against Germany, and have won honors through their efforts and sustained wounds in behalf of the great cause.

### Our Need of Trained Men.

"What has been said of England may also be said of Canada, namely, that the "idea of science," spelled in capital letters, has been lacking in the national make up. The war has stirred the industries and the public to a realization of the importance of science, but very few plants yet really believe in science, and carry out their programme of development on this basis. Germany in one well-known factory on the Rhine has more chemists than in the whole of Canada and much the same proportion holds true of engineers and trained workmen in the industries including pulp and paper. We must have the full co-operation of all if the pulp and paper industry in Canada is to be worthy of its trust and if we hope to progress beyond the range of low grade papers. There must be broad policies for training workmen, superintendents, and technical managers if we Canadians wish to have a fair share in the development which is going on. Nature has provided unparalleled forest resources and water powers and trained human intelligence must provide the rest. There should be co-operation of mills in manufacturing as well as selling. Secrecy is a relic of tradition and the visiting of mills by members of the association should be encouraged so that all of us may profit to some degree at least by the special experience which has been gained by each mill. Not every mill can have a comprehensive investigative department, but no mill should neglect its department for studying raw materials, controlling the manufacture of products and improving processes and methods. The Technical Section should be a clearing house for the discussion of problems."—John S. Bates, Chairman of Technical Section, Canadian Pulp and Paper Association.

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### 40,000 Forest Fires.

It is estimated that in 1915 about 40,000 forest fires occurred in the United States, which burned over about 5,900,000 acres and caused a damage of approximately $7,000,000.

### Tree-Felling By Machine.

A demonstration of tree-felling by machinery took place recently near Stirling, Scotland. The machine used was a No. 2 tree-feller guaranteed to fell any tree up to 48 inches in diameter.

Three trees, tough oaks of an average diameter of 46 inches, were felled in about 13 minutes each. Under normal conditions, trees varying from 42 to 48 inches have been cut in from 6 to 8 minutes, and spruce in about half the time. In the course of the demonstration it took four or five minutes to shift the machine, which is fitted with removable wheels, from one tree to another.

Usually a small portable 4 nominal horse-power boiler which can be easily moved by one horse, is supplied with the tree-feller. The advantage of the traction engine is that it can drag the trees where required after being felled.

The machine accomplished in a few minutes the work which would have taken two men four or five hours.

The trees were all felled at the ground level, and the clean cut made by the saw adds to the selling value of the timber, apart from the saving of wood. Only two men are required to work and shift the whole outfit. With the machine an interchangeable frame is usually supplied by means of which the trees can easily be cut to any required length after they have been felled.

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### Japan Exports Pulp.

Attention is directed to the development of the manufacture of paper pulp in Hokkaido and Karafuto by the report that Japan is becoming a pulp exporter to America and India. Since the outbreak of the war in Europe the manufacture of paper pulp has been well maintained, as all the circumstances are in favor of its development. Dense forests in Hokkaido and Karafuto supply excellent material, while coal and sulphur are cheap. Japan, indeed, is more favorably situated than Scandinavian countries in these respects.—Japan Times.

### Wood Uses In War.

Canada's forest wealth was reviewed in an interesting address delivered at the Normal School Hall in Ottawa by R. H. Campbell, director of forestry, under the auspices of the Ottawa Field Naturalists' Club.

Mr. Campbell pointed out that the total value of the forest products in Canada every year reaches $176,672,000 and the number of persons employed in forest industries, in addition to those industries which use wood, such as paper mills, vehicle factories, shipyards, etc., is 110,000. This, stated Mr. Campbell, is the largest number employed in any industry in the dominion, and the amount of capital invested totals $260,000,000, wages paid in the forest industries of Canada total $39,400,000 yearly, and the value of the product is $184,000,000 per annum.

In war, wood has proved to be in even greater demand. High explosives, said Mr. Campbell, were being made from wood cellulose, and immense quantities of wood were being used for trenches, huts and bridges. Germany, cut off from the supply of cotton, was made substitute articles from wood. Absorbent cotton, "slings" and splints were all being made of wood and wood products now, while the Russian soldiers are wearing paper shirts made in Japan and German and Austrian soldiers are using paper vests, socks and handkerchiefs made from wood pulp.

Carelessness was the great enemy of forests, said Mr. Campbell instancing the disastrous fires at Fernie and Northern Ontario.

### Death of Alex. Barnet.

The death occurred at his home in Renfrew, Ont., recently of Alexander Barnet, one of the best-known citizens of the Ottawa Valley, and a member of the Canadian Forestry Association. The late Mr. Barnet carried on business as a lumberman for many years. At different times he had several business partners, one of whom was the late Wm. Mackay, of Renfrew, and another the late Peter White, of Pembroke. For a number of years he had interests in B.C.

## "THE FORESTS BELONG TO CANADA"

**Sir George Foster, speaking at the luncheon of the Canadian Pulp and Paper Association in Montreal, January 31st, made a direct and impressive demand upon his hearers for the adoption of conservation methods in their relations with the forests.**

"Canada's position," he said, "depends on her natural resources. Don't kill the goose that lays the golden egg. Future generations will need wood as much as you. If you waste the heritage of to-day you are drawing the blood of our future citizens.

"Perpetuation of the forest is done in Germany and can be done in Canada if proper forestry methods are employed.

"The forests belong to Canada—not to you."

### Queer-Test of Fir.

Dr. W. W. Walkem, in an article appearing in a recent issue of the "Vancouver Daily Province," gives a striking instance of the durability of Douglas Fir. In the course of some excavation work between Vancouver and New Westminster, a Douglas fir several feet in diameter was found buried under twenty feet of water-washed gravel and sand, overlying glacial-worn rocks and moraine, presumably contemporaneous with the glacial period. The tree had to be crosscut twice to permit the passage of the steam shovel, and the wood was found to be perfectly sound. On the surface were other fir trees growing which were centuries old.

### In National Forests

During the past fiscal year there were constructed on the national forests of the United States 227 miles of new road, 1,975 miles of trails, 2,124 miles of telephone line, 89 miles of fire lines, 81 look-out structures, 40 bridges, 222 miles of fence, 455 dwellings, barns, and other structures, 17 corrals, and 202 water improvements.

# Careful of Forests in War Areas

A unique description of the effect of war on the forests of Poland is contained in a letter written by Dr. C. A. Schenck, for sixteen years the director of Biltmore Forest School, Biltmore, N. Carolina, U.S.A., and wounded some months ago while fighting in the German Army.

Due allowance will be made by the reader for Dr. Schenck's unctiousness in describing lands and peoples, trampled under the Prussian invader, with the solemn piety of an annual charities report. The description is taken from a letter written to Prof. J. S. Illick, and published in "Forest Leaves."

*In Poland.*

1. "Poland.—I have seen only that part of Poland, during a stay or rather a meandering of 5 months, which lies south of Lodz—where I was wounded quite unnecessarily. The woods and forests belong to the landed aristocracy and to the crown—in this case the Czar. The poor farmers have never had a show. It is amazing to think that the poor were formerly compelled to go begging for fuel with gigantic forests lying at their doors and the timber and wood therein going to waste. Those poor fellows were never allowed to gather even the decaying stuff. I tell you, if the land policy, from a national point of view, has been wrong in the good United States of America, then it certainly has been infernally and cursedly wrong in Poland. All these forests are now placed in charge of German foresters who have been taken from their jobs at home. No timber or wood is being cut without being previously marked. Fire patrols are maintained during the hot season. Industries, such as sawmills, paper mills, tannic acid factories, and naval store establishments, are being developed. *Never have the woods been handled better than they are now.*

II. "Belgium.—There are practically no forests in Belgium, excepting that gorgeous stretch near Brussels. The wooded areas in the Ardennes are "woodlands" or, in a few cases, park of the wealthy *e. g.*, that of Sir William Schlich. The rest is scrubby stuff, so conspicuous in the sandy plains of Flanders and the province of Limburg. There is nothing I should like to own in the province of Brabant, Hainaut, and Liege. Such were the conditions before the war. All that the Germans have done, has been to insist that the woods do not suffer from fire. I have been active along this line myself. *There is no such thing as reckless cutting by the Germans.* Wherever the woodlands have been laid low by the armies of *both* sides, it was done to build trenches, log houses, and above all to gain a free sight for the guns. A few fine avenues of trees had to come down, but upon my best knowledge and true belief less than 3 per cent. of all the avenues were thus ruined. To speak of wholesale destruction of fine woodlands by reckless soldiers, is in the case of Belgium absurd, because they did not exist before the war, excepting the famous ones at Brussels, which stand as beautiful to-day as they ever did.

*No Devastation.*

III. "Occupied Part of France.—I have no personal knowledge of this part of the war zones, for I have not been there. My informants are my relatives who have been fighting there and forest ranger Pfeifer, of Lindenfels, whom you may remember. They tell me that there is a committee on economic questions with each army corps. A forest officer of rank is a member of each committee. He is assisted by forest rangers taken from the ranks. Not a tree is cut without being marked, *except those cut by shells.* Whenever a battalion wants wood for fuel, charcoal or building purposes a forest ranger is sent out to mark the trees. Naturally, no

forest planting is being thought of, but otherwise the woods are being cared for.

"To make a long tale short, and so as not to annoy the censor unduly, let me say, that the woods of the fighting countries are suffering less from the war than the men; the animals, including game; the fields, because of lack of phosphate and stable manure; the buildings, and the human hearts."

### The Western Campaign.

"A campaign of considerable vigor has been waged in the Province of Manitoba for some time past, under the inspiration of the Canadian Forestry Association, to have the provincial legislature adopt means to stop the great timber waste in the northern sections of the province caused by forest fires. Most of these fires originated on settlers' lands where clearing operations are carelessly conducted, and very frequently result in dangerous conflagrations. The catastrophe in Ontario last summer was due entirely to settlers' fires It has been discovered that Manitoba already has committed itself to the principle of issuing permits for the setting out of fires in the northern forested districts. This is contained in the Fires Prevention Act of 1913, but the scope of the act is wholly municipal, and it has no application to the districts where fire prevention is most needed, namely, the unorganized municipalities. The Manitoba Government is now being asked to make the act apply to unorganized municipalities, and it is suggested that the issuing of permits and the supervision of the fires, so as to prevent them doing damage, might be entrusted to the rangers of the Dominion Forestry Branch, thus relieving the province of the administration costs. The Dominion Government is willing to undertake the additional duties."—Western Lumberman.

### What The West Deserves!

"It has been found that the foremost cause of forest fires have been from the carelessness of settlers engaged in clearing brush or timber from their lands," says the Calgary News-Telegram. In Quebec, British Columbia, Nova Scotia and part of New Brunswick there are laws which make it necessary for a settler to have a "burning permit" before he starts to clear his land. This permit contains stipulations as to the manner of lighting a fire, the distance from the fire of brush, of inflammable substances, etc. It is pointed out that similar legislation should immediately be put into effect in the prairie provinces and in Ontario. This matter has been strongly advocated by members of the Canadian Forestry association, and numerous letters have been written to members of the different provincial legislatures, asking that such a law be passed. United States, by means of protective legislation, has succeeded in saving in their decrease in timber fires the sum of $14,000,000 since the year 1910. Fires are shown to be diminishing in British Columbia, and also in the other provinces where this permit system is in operation.

Many do not credit the prairie provinces with the timber which they really possess, but figures officially compiled show that there is great wealth in the standing trees of the three provinces. Also, figures show that of the three territories, Alberta has the greatest timber wealth.

### Britain's Forests Reduced.

So much timber is being used for the war it is said by advocates of a government scheme for reafforestation that if the war lasts another three years the British Isles will be entirely denuded of timber. One feature of the situation is that some pre-war sources of supply are no longer available. Fifty-five per cent of timber imported in normal times came from Russia, Sweden and Germany, four per cent. from Norway, and 41 per cent. from France, Portugal and Spain. Since the war this country has had to rely partly on supplies from Norway and Sweden and largely on French and Portuguese supplies, and to make good the deficit from woods and forests in the British Isles.

To maintain the supply the nation is making huge inroads into its own standing timber. It is impossible to travel by rail through parts of Scotland without seeing the wholesale cutting of trees. The axe is making a clean sweep of whole woods. There are only three million acres of wooded land in the United Kingdom at the present time.

# Better Equipment to Cope with Fires

(*To the Editor, Canadian Forestry Journal.*)

Fire Protection is distinct from Forestry, but necessary to the latter in protecting the work from destruction by fire. If we are to secure an efficient fire protection organization. it is necessary that we specialize in this class of work, appointing an expert in charge with full authority to administer the Fire Act, suggest and advocate amendments, draw up plans to meet the varied conditions in each district, to give lectures and advise, and who would hold a judicial investigation in connection with every serious conflagration.

The appointing of a Fire Commissioner with the above authority would have a beneficial effect, give powerful support to the heads of Departments and be a thorn in the side of a feeble administration.

The building of lookout towers on high ground equipped with long range field glasses, for the purpose of detecting and locating fires in the incipient stage, and connected by telephone to the various Ranger Stations so that action to have the fire extinguished at short notice can be taken, is an advance in the right direction. The equipment however, of these lookout stations, might be improved by adding the heliograph and flashlight system of signalling and the procuring of a competent operator, and in this connection may I suggest that a fully qualified returned soldier of the intelligence department or Engineers might be obtained.

All working parties, such as telephone and trail gangs, also patrolmen, should be equipped when in the field with heliograph and flashlight so that their assistance in case of fire might be secured without delay.

The cutting of trails branching out from lookout towers to inaccessible areas to facilitate the transportation of fire fighting gangs and equipment to the scene of action is still another step towards efficiency. The construction of these trails and the mode of transportation leaves much to be desired and is not in line with the method of detection and communication. The trails on high lands through heavy timber belts should be so constructed that fire patrol by motor cycle and transportation by automobile would be possible. On lower lying areas where the timber warrants the expenditure, a narrow gauge track with power speeder for patrol and transportation is necessary. Where it is only possible to use horses, the trail should be made to accommodate a tandem of light drivers.

After locating a fire from observation post, notifying nearest ranger station by telephone or heliograph, the next step would be to make provision for a system of rapid transportation. The reaching of a fire after discovery in the incipient stage, and before it develops into serious proportions, should be the object of every fire organization. To sum up, speed and modern appliances, as advocated, by the leading authorities of our city fire departments for protection of property, are just as necessary in the protecting of our forests.

—*T. McNaughton.*

# How Menace to White Pine May Be Controlled

## Scouting for Infected Areas by Limit Holders' Employees, School Children, etc.—Official Measures Necessary.

Our last issue presented a valuable article by H. T. Gussow, Dominion Botanist, on the peril of White Pine Blister. The following article is a sequel and discusses the *control* of the disease. To every reader of the Journal, Mr. Gussow's authoritative statements should be of interest. What is contained in this and the March issues does not represent more than a portion of the original manuscript delivered at the annual meeting of the Canadian Forestry Association on January 15th, the lack of space in the Journal necessitating the omission of much that would otherwise be used.

With our present limited knowledge of the distribution of the disease, we cannot venture an opinion as to whether or not the White Pine Blister is already beyond control. Were it confined only to the comparatively few localities, in which it is so far known to occur, this question would present a much more favourable aspect since this area might be isolated by one or other effective means.

We have not yet at our disposal the great staff of inspectors used for scouting purposes in the United States, hence it would be a good plan to interest every person concerned. Lumbermen and rangers all over Canada ought to be on the lookout and report any cases observed; but a large and special appropriation will be required to do the preliminary work of locating the disease. This accomplished, then only can we arrive at some decision as to what can be done to control the trouble; provided, that we do not realize that the expense of carrying out such contingent policy may be greater than the results to be expected therefrom, and which unfortunately we cannot guarantee.

*Everybody a Scout.*

In order to deal promptly with the situation it is very desirable to secure the co-operation of all persons interested in the white pine industry. For this purpose the first essential is that everybody concerned should familiarize himself with the symptoms of the disease, and keep a lookout for it. When any infected native white pines are found, the discovery should be promptly brought to the attention of the proper officials, together with the location of the diseased pines. This would materially aid experts in ascertaining the precise distribution of the disease. And the sooner all disease centres are known, the more quickly can the work of extermination proceed.

We must bear in mind that such searches promise to be particularly successful during the season when the spore masses are produced. A further tentative suggestions I would like to throw out at this point. In the Boy Scout organization, and indeed in our schools also, we possess a source of searchful inquisitiveness, which, if instructed and guided by their teachers, might be enthusiastically enlisted in the doing of a useful work for the Dominion.

With the reporting of observed cases of Blister Rust on pines to the proper authorities, it becomes the task of the officials to adopt the best means for eradication suggested by the circumstances of the outbreak.

*Official Measures.*

Let us, then, see what official meas-

ures have been or are available for coping with this disease, and what further steps should be taken, if so deemed expedient.

On learning that suspected pine seedlings had been introduced into Canada from abroad, this source of danger was promptly eliminated. The Dominion Government prohibited the importation of all five-leaved pines into Canada from anywhere abroad. Similar action has also been taken by the United States' authorities. We are, then, assured that no more diseased pines will reach this country, or the continent of America, in future.

We in the Dominion of Canada, are in a very fortunate position concerning federal legal enactments directed towards the control of destructive insects, pests, and diseases. Those familiar with the general regulations under the Dominion Destructive Insect and Pest Act will realize that we already possess wider powers under this Act than perhaps any other country in the world. But, before bringing legislative activities to bear, the preliminary work just referred to must be accomplished, and the sooner this is done, the better.

*Eradication of Pine.*

As far as blister rust is concerned, it is no question, in the present state of our knowledge, of treatment of infected pines, but of eradication of diseased trees. We are of the opinion that the distribution of white pines from nurseries within danger zones should be promptly prohibited, since incipient attacks, as already stated, may escape notice during inspection, and, moreover during the incubation period no reliable signs are exhibited by infected pines. Such incipient infections as represented by these stages, distributed by seedling pines, would only result in a wider spread of the disease, and render the problem of protection from diseases a very doubtful, or at any rate, very difficult matter even to the trained official.

*Stop Distribution?*

The issue raised here is, shall we permit the distribution of white pine, pending the settling of the question of the extent of the menace from this disease, or shall we take initial precautions and refrain from distribution, until the true nature of the threat from this scourge has been ascertained—in other words, till we know if the menace to American white pines will turn out to be as serious as it has proved itself to European white pines, and one which has seriously affected the use of white pine for afforestation purposes in northern Europe?

I believe, from frequent discussions of the subject of control of Blister Rust in Canada, that we are agreed that extermination of suspected plantations, if faithfully carried out, and if coupled with replacement of the same by healthy trees will do more towards stamping out the disease than periodical and difficult—and, at that, inefficient—inspections.

*Inspection Very Costly.*

Periodical inspection of nurseries has been often recommended. But, from actual experience, it has been learned that the closest inspection possible will not reveal all infected trees, and new infections will be found year after year. In the United States, where the disease is widely prevalent, it has been found that, in many cases, the cost of continued inspection will more than replace the diseased plantations with healthy trees, and that this latter policy would be more economical than the continuation of periodical inspection.

At least three states—New Jersey, New York, and Connecticut—have already destroyed entire shipments of white pines, when the disease was found in them. The destruction of infected plantations is the logical continuation of this policy. It will rid the country of the disease, and is, apparently, the only sure method of doing so.

*Whole Grove Infected.*

It is no easy matter to stamp out the disease once it appears in native pines. I recall one case at Fonthill, Ontario, where the disease appeared

in a small grove of pines. Notwithstanding careful search by expert plant pathologists, it was found impossible to cut out all infections, and new ones were found regularly after each successive visit. In this case the best proceeding would have been the destruction of all the pines, whether affected or not, in this small wood, when this centre of infection would have been wiped out forever.

We have learned that the spores from the pine infect wild and cultivated currants and gooseberries. These spores are mainly windborne, and speculation is rife as to how far these spores can be carried. This is one of the most difficult problems to solve, and has never been solved—other than hypothetically. Insects, no doubt, also play a part in the dispersal of spores. For our purposes the distance spores may be carried from an infected pine is of some importance. For, without currants, or similar hosts, within the radius covered by spore dispersal, the blister rust would eventually die out with the pines originally attacked, and no new pine infection could occur.

*Carried Two Miles.*

Observations made in the Fonthill case of Pine Rust already referred to indicate that the matter of spore dispersal, or rather the distance spores may originally be carried, is of less importance than the fact of the spreading of the disease from currant to currant throughout the summer. As early as June 3rd the first infections on currants near the Fonthill pines were observed. On July 6th the rust on the currants had been spread to, approximately, two miles from the original source. In this connection it may be noted that each infected currant or gooseberry bush serves as a source for the dispersal of spores. And the most widespread dispersal is, without doubt, due to the currants. This spreading of the disease in the stage of Currant Rust takes place throughout the summer, from mid-June to October: whereas, from the pine, dispersal only tzakes place for about eight weeks or possibly less, during April, May and up to mid-June.

For the practical purpose of locating the spread of the disease we look upon the *Ribes* bushes as welcome indicators. Thus, during the whole summer, inspection of all wild and cultivated *Ribes* may clearly indicate the limitations of the present danger zone.

*Pines or Currants?*

We notice, then, that the currants are largely instrumental in the dissemination of the disease within an infected locality. The Niagara Peninsula is singularly subjected to the spread of this rust. On the one hand there exist uncountable numbers of wild *Ribes*,—on the other hand is the importance of the district as a fruit-growing centre with many hundreds of large and small plantations of currants,—particularly of that most dangerous carrier, the black currant. Hence, in this area, either the one or the other host plant should be exterminated. Here it would certainly seem that all pine trees should be sacrificed.

This sounds more serious than it really is. Of course, on looking over the district there may be found numerous pines, but few are of economic value; even were it so, well, they are worth good money now, and the losses would be inconsiderable. Yet there are many trees of sentimental value. These latter will prove a great obstacle to the control of this disease. But the exemption of these trees from destruction would add thousands of dollars every year to the cost of fighting the disease; since experienced inspectors would have to inspect every single remaining tree most carefully, and cut out all infected parts. And eventually the inspector is sure to be blamed for the destruction of the trees, if he be, as most assuredly he must be, authorized to cut out infections. Yet to leave these trees alone, even if only solitary or few, would, as experience has shown, merely result in perpetuating the disease in a region so productive of secondary hosts.

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(*To be concluded in March issue of the Journal.*)

# Annual Meeting of The Association

## President Miller's Report Takes Note of Conservation Progress Throughout Dominion—Directors Tell of Successful Year.

### *The Annual Meeting in Brief*

Hon. Sydney Fisher, chosen President for 1917; Mr. Gordon C. Edwards, Vice-President.

Directors' Report stated that 1007 new members had been added in 1916. Sum of $1310 raised for Publicity Extension. Thirty-seven public illustrated lectures given ; other lectures by the "forest travelogue" outfit supplied to local speakers. Free cartoons appeared in hundreds of newspapers. Large numbers of special articles supplied to the press. School children and Boy Scouts brought into touch with forest conservation movement. Successful campaign waged in Ontario for reform of the forest protection system.

Receipts for 1916 totalled $8,622.12 and expenditures $8,038.37, leaving a balance of $583.75.

The Eighteenth annual Meeting of the Canadian Forestry Association was held at the Chateau Laurier, Ottawa, on Monday, January 15th. In accord with the policy of holding no conventions until the close of the war, the day was divided into two sessions, with a business meeting in the morning and addresses and discussion in the afternoon, the attendance for the latter being particularly good. In the evening a banquet was held at the Laurentian Club.

The report of the President, Lt. Col. J. B. Miller (President of the Polson Iron Works, Toronto) with the Directors' report, and other proceedings of the morning meeting are given in the following pages. Hon. Sydney Fisher was elected President and Gordon C. Edwards, vice-president for the current year. Mr. J. T. Horne the nominee of the Fort William Board of Trade, was elected a director in succession to the late Mr. John Hendry, of Vancouver. Two changes were made in the list of Territorial Vice-Presidents, Hon. T. D. Pattullo replacing Hon. W. R. Ross for British Columbia, and Hon. W. M. Martin replacing Hon. Walter Scott for Saskatchewan.

### *The President's Report*

The Canadian Forestry Association has passed through a year in which its national usefulness has been put to more than ordinary tests. While public interest was directly focused upon the prosecution of war, with all other patriotic concerns in abeyance, one might have anticipated a period in which the Association would be obliged to mark time. The deepened patriotism of the Canadian people, however, has expressed itself not only in military activities but in the development of a more intelligent and generous interest in great civil undertakings such as the national movement for forest conservation.

Doubtless the strain placed upon the country's resources has compelled many people to examine more closely national sources of income and in this way the forests have assumed an interest and importance previously withheld. Then, too, the greatly increased knowledge of the management of natural resources in the countries now at war has brought us to realize our unfavorable rate of progress in the application of forestry principles.

*The Public Awakening*

During the past year, the Canadian Forestry Association has taken advantage to the limit of its powers of the new opportunities for propagandist work. It is gratifying to find so many evidences that Governments, corporations, and individuals recognize the resonableness of those objects for which the Association has long contended. The record of forestry progress in 1916 alone would justify our efforts during many years past. We should regard with much satisfaction the many signs of public awakening from coast to coast and look forward to a steady advance in forest conservation in years to come.

In all parts of the world the forest conservation movement advances or lags according to the local need for and valuation upon wood supplies and the profits from commercial exploitation of forest materials. The great stimulation to the news print paper manufacturing industry in Canada during the past year, due to an increased demand from the United States, has contributed a new basis of values to Canadian spruce and balsam forests. It has equally emphasized the gravity of our preventable forest fires and brings into the foreground of profitable propositions the replanting of cut-over and barren lands by pulp and paper companies, as well as by Governments.

*The "Idea of Science"*

Much importance may also be attached to the work of the Technical Section of the Canadian Pulp and Paper Association which has developed remarkably during the year. The necessity for technical study of *industry*, wherein the Forest Products Laboratories at Montreal are now playing an important part, is recognized today as never before. We may reasonably look forward to the application of scientific methods to all industries engaged in wood manufacture, thereby achieving economy and efficiency from the woods operations through to the finished product.

*Ontario's Move*

The action of the Ontario Government in creating a new department of forest protection under the direction of the Provincial Forester, Mr. E. J. Zavitz, may be taken as the outstanding occurrence of the past year as far as concerns the objects of this Association. The Minister of Lands, Forests and Mines has definitely undertaken not only to re-organize the forest protection system which has been admittedly inefficient for a great many years, but to support the new department in the construction of permanent improvements for fire detection and fire fighting, and to bring before the Legislature a settlers' permit law, applying the plan of 'burning permits' to at least a portion of the timbered area. If thoroughly carried out, as we believe they will be, these provisions as announced by the Minister will tend to prevent periodical destruction of lives and great losses in forest wealth.

I may be permitted to say also, that while the Association pledges itself to support the Minister of Lands, Forests and Mines in carrying out his new policy of effective forest protection, we contend that our critical attitude towards the old system in Ontario and our campaigns to stimulate public sentiment to demand a thorough reform were altogether justified. The Association's work in Ontario has been an illustration of the need for just such an independent, unhampered body working in the public interest.

*In New Brunswick.*

The Government of New Brunswick has undertaken a forest survey and land classification scheme which

is certain to repay the province handsomely. An accurate knowledge of the location, composition and value of forest areas, and likewise of agricultural soils is the foundation of any intelligent administration, and the plan ought to be applied in advance of settlement in all parts of the Dominion.

It is desirable to call attention to the excellent record in fire prevention on the large and valuable timber areas of the St. Maurice and Lower Ottawa Forest Protective Associations in the Province of Quebec. With over 1200 'burning permits' issued to settlers in the St. Maurice territory, not one fire got away, and in suppressing 200 fires caused by other means during the season the loss of merchantable timber amounted to only $700 and total losses in young growth, cut over lands, etc. to about $4200. On the lands of the Lower Ottawa Association more than 1000 settlers' permits were issued and only one fire got away, doing little damage. The proof of actual prevention of forest fire losses as provided by these Associations must soon persuade other licensees to try the co-operative plan thereby saving on the cost per acre for patrol, and multiplying many fold the degree of protection. The Quebec Government has given these Associations invaluable help by amending the statutes and regulations and the Minister of Lands and Forests is to be congratulated upon the progressive steps to which he has committed his department.

### *The Prairie Province.*

The prairie provinces have been the scene of further activities by the Canadian Forestry Association. We first placed before the Ministers of the three Provincial Governments a proposal for the adoption and enforcement of a settlers' permit law so as to give the northern timbered districts protection against settlers' clearing fires. While the legislatures are yet to deal with the question of their 1917 sessions, we have reasons to believe that the adoption of the plan will not be long delayed. A great work remains to be done in cultivating a better sentiment in the people of the prairies of the need for conserving their forest possessions. As shown by the Directors Report, this task has been taken in hand some months ago by effective publicity methods.

In British Columbia, the year witnessed the resignation of Mr. H. R. MacMillan, a director of the Association, from the post of Chief Forester of British Columbia to engage in private business. The services of Mr. MacMillan to his Province were of the highest order and it is a matter of gratification to know that the new government has appointed the Acting Chief Forester, Mr. M. A. Grainger, to take his place.

### *Damage by Fire.*

Reports of fire damage to the timber of the country during 1916 inform us that without counting the number of millions that have been needlessly sacrificed, the damage occurred very largely where forest protective organization was weakest. In the Claybelt of Northern Ontario, in the Lake St. John, Saguenay, Black River and Kippewa districts of Quebec, the degree of forest guarding was not comparable with those regions, such as the St. Maurice Valley or British Columbia where organization for fire control is thorough. As concerns the Dominion chartered railways, the record of forest fire immunity along their lines in 1916 is thoroughly creditable. Practically no fires occurred which could be attributed to railway agencies.

It is fitting that some reference should be made to the remarkable proportion of Canadian forest engineers, forest students, rangers, and others in forestry occupations who have taken up military service for their country since the earlier days of the War. Quite two thirds of the technical foresters in the country have long since enlisted, chiefly as combatants, and the number of killed and wounded and of those given military honors testifies warmly to their spirit of sacrifice.

## Report of The Directors

For the third time in succession the review of the Association's work is written under the shadow of the World War. Obviously, the pursuit of forest conservation ideas has been strongly influenced by the new activities, changing points of view, and more intense national spirit developed through years of strain and tragic sacrifice. While these times logically have handicapped some departments of our work, there have been many great compensations and it is the belief of the Directors that the Association has encountered its new opportunities successfully and carried out the purposes for which it was founded.

In the building up of membership and revenues, the year 1916 shows pleasing results. One thousand and seven new members were brought into the Association and this, with our gain of 450 in 1915 represents an advance of 50 per cent. during the last two war years.

*Raising New Money.*

In order to avoid curtailment of the extensive programme laid out for 1916, the Secretary raised a special fund, known as "The Publicity Extension Fund," amounting to $1310 in which the following firms and persons are represented: Laurentide Company, $200; J. R. Booth and C. Jackson Booth, $200; J. B. Fraser, $100; St. Maurice Paper Company, $25; Hon. Nathaniel Curry, $50; Canada Paper Company, $10; River Ouelle Pulp and Lumber Co., $25; Sir George Perley, $25; Riordan Pulp and Paper Co., $25; Sir Clifford Sifton, $100; Howard Smith Paper

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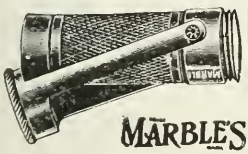
*The Work in Ontario.*

A considerable portion of the Secretary's time was devoted to campaigns to improve the forest protection situation in Ontario. During the first four months of the year, the chief Boards of Trade, Canadian Manufacturers' Association and other influential bodies were persuaded to take action upon the inefficient and serious conditions within the Ontario forest protective branch. As a consequence, twenty-two of the Ontario Boards of Trade and other societies working in harmony with the Forestry Association took vigorous action, placing resolutions in the hands of Government authorities. Propagandist work was greatly assisted by the writing of scores of special newspaper and magazine articles, public addresses by the Secretary, a cartoon service which was widely employed, and the co-operation of Ontario editorial comment. After the disastrous fire in the Claybelt between Matheson and Cochrane in midsummer, giving tragic point to the criticisms

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of the forest protective system, the campaign for reform was repeated on nearly identical lines, the combination of Boards of Trade, newspapers, etc., until the press of the province was practically unanimous in insisting upon a radical forest service reform along the lines laid down by the Forestry Association. Then followed investigations by the Secretary of conditions in the fire-swept districts with the result that the Association was able to present further evidence favoring the introduction of 'burning permits' for settlers' clearing fires, better patrol and inspection of rangers, and other points of improvement. Finally a large deputation representing bankers, insurance companies, manufacturers, lumbermen, forest engineers, settlers, mine owners, newspaper publishers, and many other important interests appeared before the Minister of Lands, Forests and Mines, when the subject of forest service re-organization was discussed amicably and the Government's decision announced. Ontario's forest protective service is now under a new department, with Mr. E. J. Zavitz as its chief, and there is every reason to look forward to a quick fulfillment of the Minister's assurances regarding a settlers' permit law, re-organization of the ranger system, the wider use of permanent improvements, and other modern methods capable of giving lives and timber the protection from fire to which they are entitled.

*Stimulating the West.*

Realizing that the outstanding requirement of the forested areas of Manitoba, Saskatchewan and Alberta is the elimination of fire losses, as far as possible, the Association undertook to bring before the newspapers, members of the Governments and Legislatures, the Grain Growers and co-operative associations, municipal associations, etc., the need of supervising settlers' clearing fires in the northern areas. This entailed a large amount of special literature, the situation being explained to the people of the West in brief illustration pamphlets, each discussing a new phase and supplying evidence of the importance of the prairie timber possessions and the successful protective schemes in use elsewhere. While the members of the legislatures were being informed continually on this question, the Prairie Province members of the Forestry Association, numbering 900 were persuaded to write to their representatives and Ministers of the Governments, asking their support of this and other progressive enactments in forest conservation. By these and other means, the Association has stimulated Western interest in problems of the provincial forests and there seems a strong likelihood that one or more of the provincial governments will take the valuable co-operative action in fire prevention as has been outlined.

*Menace to White Pine.*

The finding of areas of white pine in Ontario and Quebec, infected by the White Pine Blister disease received due attention. Newspaper and magazine articles called the attention of the public to the seriousness of the menace. Illustrated literature was sent to all Eastern limit holders and, more recently, a special pamphlet, setting forth expertly the need of action in suppressing the disease, was written for us by the kindness of H. T. Gussow, Dominion Botanist, and sent to all known holders of white pine in Ontario and Quebec. Letters on the same subject supplemented the printed issues and it is encouraging to know that so many leading lumber companies have instructed their woods employees to use the Association's literature in searching out infected trees and bushes.

The Secretary delivered 37 illustrated addresses, at Winnipeg, Fort William, Sudbury, Cobalt, Haileybury, McGill University, Montreal High School; Grand Mere; Cardinal, Sault Ste. Marie, Hamilton, Brockville, Marmora, Prescott, Queen's University, Kingston; Bishop's College, Lennoxville; Macdonald College; St. Andrew's College, Toronto, Montreal, and a series of seven open-air illustrated addresses to large audiences in the Georgian Bay and

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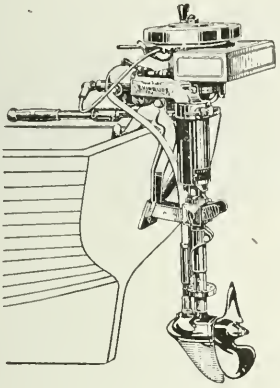

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Numerous cartoons, emphasizing the value of permanent forest possessions, the immensity of the forest industries, the cause and prevention of forest fires, etc., were sent to every province and used in hundreds of dailies and weeklies.

The Publicity Bureau of the Association prepared and issued large numbers of newspapers and magazine articles of an educational nature, sometimes taking up topics of special interest to the papers of one or two provinces, such as the New Brunswick forest survey, the pit prop requirements of the Alberta coal mines, etc.

*Rousing the Children.*

Illustrated pamphlet-lectures called 'Forestry Talks For Young Folks' were placed in the hands of 3000 school teachers in all parts of Canada, for use in their class rooms. This was managed with the consent and co-operation of local school boards and many letters have mentioned the Forestry Association booklets as being used as part of the regular reading course of pupils.

The Association has always placed much emphasis upon the education of the Canadian boy and girl in a correct estimate of the value of the forest possessions. An introductory story, dealing with the national and economic importance of perpetuating the timber supplies, the record of fire waste and other subjects was turned out under the name of the Boy Scout Forest-Book and given by us to the 15,000 Scouts in Canada. Interest was further stimulated by a revision of the Boy Scout Manual's references to forestry, through the kindness of Mr. Clyde Leavitt and other friends of the Forestry Association, with the

result that the Boy Scout may now qualify for a Forestry Badge by passing the Forestry Test.

A new forest-book for French-Canadian boys, entitled, 'Le Premier Livre Sur La Foret' is now being issued and the first edition of five thousand copies will receive judicious distribution.

It is worthy of mention, too, that public illustrated lectures in the French language were arranged for and a beginning will be made in the Eastern Townships. In this undertaking the Association co-operates with the Quebec Department of Lands and Forests. The Secretary was unable to go to British Columbia for special work in 1916, as was planned, and at least four weeks will be devoted to propagandist work and inquiry in the Prairie Provinces and British Columbia beginning about the end of February.

*Advisory Committee Formed.*

A development of the machinery of the Forestry Association which promises important results was the formation of a special Publicity Advisory Committee, consisting of H. R. Charlton, General Advertising Agent of the Grand Trunk Railway System; A. McKim, President of McKim's Advertising Agency, Montreal, and H. d'Hellencourt, Chief Editor of Le Soleil, Quebec. In order to stimulate the use of attractive educational matter by the forest departments of the various governments, this committee will pass upon certain special schemes of educational literature prepared by the Secretary for submittal to the Governments. It is hoped that the advice and endorsation of these gentlemen will ensure a much wider circulation for such publicity devices as the Association may from time to time bring forward.

The Canadian Forestry Journal has proved of most substantial value in disseminating useful information to 4700 readers month by month and in binding together the membership. The Journal has served a valuable purpose also in creating an informed public opinion, even within the limitations of its membership, and the practical effects of this are becoming more and more evident.

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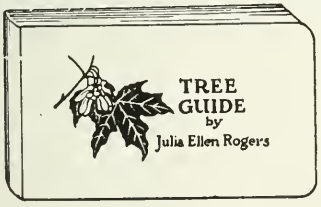


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*The Merit System.*

Two Special Committees presented reports. For the committee of three appointed last year to take up with the Dominion Government the matter of extending the scope of the Civil Service Act to cover the outside service of the Dominion Forestry Branch, Mr. Ellwood Wilson, convenor, stated that through correspondence the views of the Association on the merit system in public appointments had been brought before the Government of British Columbia, the Premier of which, Hon. Mr. Brewster, had pledged himself to build up the Forest Service without regard to the old patronage plan and had made an excellent commencement by the appointment of Mr. M. A. Grainger to the post of Chief Forester.

The Secretary reported for the Committee of Ten, appointed to take up with the Provincial Governments of Eastern Canada the matter of the collection and publication of uniform statistics of forest fire losses. This committee, consisting of Messrs. Leavitt, Goodeve, Prettie, Zavitz, Piche, W. F. V. Atkinson, Dwight, R. B. Miller, Grainger and Finlayson, had tried to stimulate the collection of accurate statistics by the private limit holders of Ontario, issuing a special statistical form for that purpose. A good deal of success was secured and a fresh effort will be made in 1917 to have the response more general.

*Slash Disposal.*

Mr. Ellwood Wilson introduced to the meeting a new field in which he thought the Association ought to be active. He advocated the formation of a committee or committees on slash disposal, also to encourage co-operation between all those interested in forestry. He thought slash disposal was worth all its cost. The benefits of co-operation of forestry activities were so extensive and so practical that the Association might well take the matter in hand. A third avanue of investigation and discussion was the taxation of forest-planted lands. Mr. Wilson moved that a committee be appointed to take action.

Mr. Clyde Leavitt called attention to an anomalous situation on licensed timber berths in relation to the technical administration of Dominion Crown Lands. Questions of diameter limits, selection of seed trees, and brush disposal were not being given consideration as was emphatically necessary in the country's best interests.

Mr. W. B. Snowball said that his forester, (Mr. J. R. Gareau) had reported that he would experiment for next season in slash disposal by establishing an experimental camp, trying the burning of slash. At present the lopping of boughs was the general proceedure.

Mr. P. Z. Caverhill, Forester of New Brunswick, said that the stands were lighter and brush disposal costs heavier in New Brunswick than would be true of some other parts of Canada. Brush disposal would cost from 25 to 50 cents per thousand feet if done in the winter months.

Mr. Leavitt moved, seconded by Mr. Prettie, that a committee of five be appointed, with Mr. Ellwood Wilson as Chairman, and that the latter select the other members of the committee subject to the consent of the incoming president. Mr. Wilson's committee was afterwards entered as follows: Messrs. H. R. MacMillan, R. D. Prettie, Clyde Leavitt, T. W. Dwight, Ellwood Wilson (Chairman).

*The Afternoon Addresses.*

A large audience attended the afternoon meetings, attracted by a group of addresses dealing with vital questions. The excellent paper on "The Control of White Pine Blister Rust," by H. T. Gussow, Dominion Botanist, which is reproduced, in part, in this issue was supplemented by papers from G. C. Piche, Chief Forester of Quebec, and E. J. Zavitz, Chief Forester of Ontario. The latter speakers presented a thorough review of the steps taken by the Provinces of Quebec and Ontario to locate the menace and prevent infections from spreading.

In the absence of Mr. T. J. Welsh of Bemidji, Minnesota, who was de-

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tained by labor troubles in his camps, the subject of "Slash Disposal in Commercial Lumbering Operations" was carried along by Messrs. R. H. Campbell, Director of Forestry, E. H. Finlayson, District Inspector of Forest Reserves, Calgary, and R. D. Prettie, Superintendent of Forest, Canadian Pacific Railway, Calgary.

"Canada's Work in Forest Research," by W. B. Campbell, Assistant Superintendent of the Forest Products Laboratories, Montreal, gave the audience a clear and interesting outline not only of the investigations immediately under way, but of the wider scientific purposes for which the Laboratories were brought into being.

The Annual Dinner at the Laurentian Club took place at 6.30 p.m. Hon. Dr. Roche, Minister of the Interior, Hon. Sydney Fisher, Mr. R. H. Campbell, Mr. W. B. Snowball, Mr. Ellwood Wilson and Lieut.-Col. J. B. Miller were at the head table and were heard in felicitous speeches. The enjoyment of the guests was much enhanced by clarinet solos by Mr. Fred. Bysche of the Dominion Forestry Branch and vocal solos and duetts by Mr. Stafford Salmon and Corporal White.


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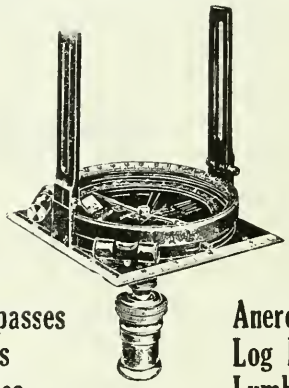

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# Resolutions at Annual Meeting

*Resolved*—That the Canadian Forestry Association urge each provincial government in eastern Canada, not now doing so, to investigate the pine blister situation in the province, especially along the international boundary with a view to the location and eradication of infections.

*Resolved*—That the Dominion Government be urged to make an immediate appropriation of $50,000, for the investigation, location and eradication of the pine blister disease in Canada, in addition to the amounts to be expended by the Provinces. The Association expresses the opinion that the employment of additional plant pathologists in the Department of Agriculture is essential in this connection.

*Resolved*—That the Dominion Government be urged to take action, wherever necessary and in whatever manner deemed advisable, to prevent the spread of the pine blister disease from infected districts.

*Resolved*—That the President of this Association be asked to co-operate with the Commission of Conservation and with the Canadian Society of Forest Engineers to press upon the Minister of Agriculture the importance of dealing promptly and energetically with the pine blister disease, as a Dominion problem.

*Resolved*—That the efforts of the Association be continued in the direction of Civil Service reform, in the Dominion and Provincial fire protective services.

*Resolved*—That the reduction of the fire hazard through slash disposal be urged by the Association whenever conditions are favorable. It is believed that special attention should be given to this situation in connection with licensed timber berths on Dominion Crown Lands.

The Secretary of the Association was authorized to prepare suitable resolutions in connection with the death of Mr. John Hendry.

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"These are rather startling figures, and this Association should do everything within its power to lessen this great loss."

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Co-operates actively with forest protective associations, Government forest departments and commercial organizations in distributing information on forest affairs to the Canadian public.

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Holds series of illustrated public lectures on forest protection in various sections of the Dominion.

Issues an illustrated monthly, "The Canadian Forestry Journal," which goes to 4,500 members, and to 200 Canadian editors by whom it is quoted extensively.

Holds conventions in various sections of the country to discuss local and general forest problems, and to arouse interest in public forest policies.

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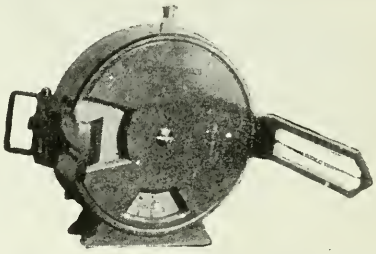

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Vol. XIII

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# In the Maple Sugar Season

## An Interesting Sketch of the Sugar Maple and the Gathering of Sap Since Indian Times

*By Maud Going, Author of "Our Field and Forest Trees", (McLurg & Co., Chicago.*

The sugar maple is prized for the richness, as well as for the abundance of its sap. While the snow is still lying on the ground the tree shows that spring has awakened it by the ceaseless drip of its watery blood into a tin pail, hung at its side. When the sun warms the tree, in the middle of the day, so that the sap "runs well," about seventy drops fall into the pail every minute. It is a slow business, but it goes on every day for about three weeks. By that time the tree has parted with twenty-five gallons or so of its life-blood. But this boils down to rather less than five pounds of sugar.

As soon as the maple leaves begin to unfold the sap becomes less sweet, and the sugar made from it is darker and has less of the peculiar maple flavor, while the flow from the birch stops altogether as soon as the flower-chains cast off their winter nightcaps and begin to lengthen. In later spring, the best of the maple sap, and all of the birch sap, is used as fast as it rises, to nourish the waking flower-buds, to start young leaves to life, and to help new shoots to grow.

So the sugar-maker's season is a short one. It begins when spring stirs among the roots, and it ends when buds awaken and unfold.

Maple sap used to be boiled down in a large caldron swung gipsy-fashion over an open-air fire. Warm, flickering lights played over the snow, the lilac-gray trunks of the maple trees, and the busy workers stirring the pot and feeding the flames. But today, on many farms, a patent evaporator takes the place of the gipsy kettle, and a bricked-in oven does the work of the leaping fire. The new way is more economical—and far less picturesque.

### *Indians Were First*

The Indians were the first makers of maple sugar. Indeed, before the white man came, bringing the sugar-cane and the honey-bee, this was the richest sweet the red man knew. It came, too, when the poor Indian had just gone through his hungry time, the scanty fare, or perhaps the starvation, of the cold and cruel winter.

The Iroquois used to hold a public festival every spring to celebrate the tapping of the maples. "It consists," says a Government report, written thirty years ago, "of a war dance which will, it is hoped, bring on warmer weather and cause the sap to flow. At the close of the sugar season, follows the maple-sugar festival, the soups of which are all seasoned with the new-made delicacy. This festival, in which a number of dances are introduced, lasts but one day."

Now that cane sugar can be bought so easily and cheaply, even at traders' stores in the wilderness, the Indians boil less sugar than they did, and some of them are forgetting how to boil it at all. But fifty years ago the Menomini used to make many tons of maple sugar every spring.

### *Crows Gave Signal*

The sugar-boiling season was opened by the arrival of the first crows, flying back from the South. It was eagerly expected, and became a holiday for everybody. Each housemother had her own sugar hut, built

in a grove of maple trees, and she returned to the self-same spot each season. She had provided herself with a number of sap pans and buckets, made of four-cornered sheets of birch-bark, with their edges turned up and their corners folded in. They were tightly stitched into shape with threads of basswood, or with strings obtained by splitting the fine rootlets of the cedar. An Indian woman might have from twelve to fifteen hundred of the birch-bark vessels. Wooden sap-troughs were also at hand, made from time to time in the summer season.

When the crows appeared, everyone was on the lookout. As soon as the necessary camp outfit and sugar-making utensils could be gathered together each family moved to its own sugar grove. There wigwams were put up for sleeping quarters, and a wooden hut, with a roof of bark or mats, to shelter the sugar-makers.

Sometimes we hear the Indians called lazy, but there is a Menomini story of the maple and the sap, which shows how well the red man knows that work is good for the soul.

### *The Story of the Sap*

The first maker of maple-sugar—so runs this story—was Nokomis, the earth, grandmother of Manabush,

THE MAPLE SUGAR SEASON IN QUEBEC

Upper picture illustrates the gathering of the sap and the use of pipe lines. Lower left hand picture, tapping a fresh tree; lower right hand, a 'sugaring off' party, which from earliest pioneer times has been a highly popular festivity, an invitation to which few men can resist.

who was the hero of many Indian fairy tales.

When Nokomis had cut holes in the trees, one for each vessel she had made, Manabush looked into the vessels, and saw that they were filling with thick syrup.

"My grandmother," said he, "it will not do to have these trees produce syrup in this manner. The people will not have any work, if they make sugar so easily; they must cut wood, and boil the syrup for several nights to keep them busy, so that they may not form bad habits."

Manabush climbed to the tip top of a maple and scattered water all over it like rain, so that the sugar should dissolve and flow from the tree in the form of sap.

This is why people always have to work hard when they want to make sugar. Wood must be cut, vessels must be made, and the sap that is collected must be boiled for a long while, otherwise the people would spend too much time in idleness.

So, thanks to Manabush's kind interest in Indian morals, the sap of maples has nowadays less than four per cent. of sugar.

### *Swaying Pumps the Fluid*

The sugar-maker is helped by a series of warm, sunny days, followed by sharp, frosty nights. March gales help him by swaying the tree. Darwin, that great student of life and its laws, caused a twig to drink some water containing a strong dye, and then he could follow the travels of the sap as it mounted through the wood. He found that when he kept bending the twig to and fro with his fingers the sap was forced to rise much faster.

The tree sways with every breath of wind. Every time it bends, the wood-cells are squeezed and the sap is forced out. Everytime it straightens again the little tubes and cells fill with sap from below.

But no one can really understand or fully explain the rise of the sap.

From the lowest root-tip to the topmost twig of a gigantic tree, water may have to travel a distance of three or four hundred feet. For much of this distance it must climb straight up, and all the journey is through tubes as fine as a hair. We must remember, too, that these tubes are not continuous, like the water-pipes of a house. The sap goes up through a long series of wood-cells like little oblong boxes piled end to end.

### *When the Leaves Breathe*

Later in the year, when many leaves are spread wide in the sunshine, water is breathed away from the upper part of the tree. Some of the cells up there part with so much moisture that their sap becomes thickened, and this causes a suction which draws more watery sap up through the wood from below.

When summer is here, and growth is active, there are, furthermore, little bubbles of gas in the sap, and these, as they rise, help to bring the sap up with them.

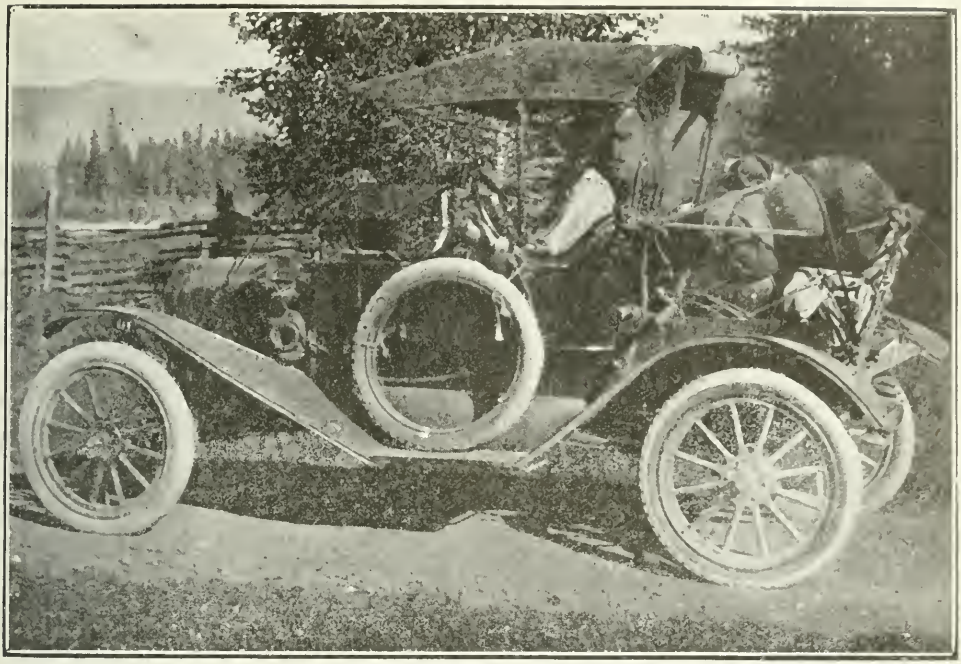
But even when all these things are considered, we cannot fully understand how or why the sap rises as it does. Its upward mounting is the greatest wonder of the spring.

---

## COMMENT ON NEW BOOKLET

*From Montreal Herald*

In order that the French-speaking children of Quebec shall grow up with a patriotic knowledge of their forest resources and what their maintenance means to the future of the country, the Canadian Forestry Association of Ottawa has issued another of its children's series: "Mon Premier Livre Sur La Foret," by Robson Black. It is being distributed free through church and civil agencies. The booklet contains 32 pages and 25 photographic illustrations and acquaints the youthful or adult reader in a most entertaining way with the forests, the forest industries, the work of fire rangers, and the inexcusable havoc of fires. This booklet makes every tree a working partner in the provincial estate and ought to make the forest resources better understood.



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# The Motor Car in Timber Guarding

## Try-out in Vernon District Proves 100 Per Cent. Gain Over Horse Travel.

*By Geo. P. Melrose, District Forester, B.C. Forest Branch, Vernon, B. C.*

Forest Protection in any country and under any conditions must, if it is going to succeed, make full use of every modern invention possible to insure speed. Once a forest fire starts, the utmost speed is required in every operation affecting it. The man on Lookout must discover it with the least possible delay and locate it properly. He must transmit his discovery to the nearest patrolman with the utmost speed. The patrolman must proceed to the fire and extinguish it just as fast as he can possibly travel.

To obtain this speed we have supplied Lookout with field glasses, accurate maps, and telephones and patrolmen with horses.

Horses, up to a few years ago have proved to be the best and fastest means of travel over the roads, but since the advent of automobiles the days of the horse have been numbered. This is especially the case since cheap autos have come on the market.

That autos are a success and an improvement over horse travel is fully borne out by the number of commercial houses that are using them. Everywhere commercial travellers, agents and all others whose business takes them through the country are using cars, and their increased business is ample proof that they pay.

To fully satisfy the need for speed and make the Forest Protective sys-

tem as efficient as possible, patrolmen, guards etc., should be supplied with cheap, good automobiles in order to get them to fires with the minimum of delay and the maximum of fighting force. This, of course, subject to the presence of the necessary roads.

It goes without saying that in order to use Automobiles effectively there must be a good system of roads covering a large part of the District to be patrolled.

*Roads Bring Their Hazards*

There is another part that roads play in the scheme. They create hazard. Owing to the extra amount of travel engendered by roads the total danger of fires starting is greatly increased. We find in looking over almost any map of fires that a very large percentage occur along roads and other travelled routes, and travellers are charged up with starting a great many fires.

Outside of the fires actually started along the roads as the result of travel the largest percentage are started in close proximity to roads. This is quite natural as nearly all fires are the direct result of human occupation of the country which naturally presupposes roads.

In the Vernon District, we have a thickly settled country covered by a good system of roads, with over ninety per cent. of the annual fires occurring in their close proximity We also have at very convenient intervals, towns and villages with garages and fuel supply depots. The main roads can hardly be surpassed in any part of the country, while the lateral roads everywhere are in condition to allow good speed to be made with a car. With such conditions in our favor we started the 1916 season with three automobiles and one motorcycle. The results show that they have more than paid for themselves in the first season of their use.

Only one of these cars was used by a temporary guard, the other two cars and motorcycle were used by the permanent supervisory staff.

Unfortunately, in a way, the season proved so safe from a fire protection standpoint that it was not found necessary to put lookout men on duty at any time, and we were not able to secure figures on and work out a system of co-ordination of Lookout and automobile. I am however, fully convinced, through the speed and efficiency developed in fire prevention, detection and control by the cars in use that that patrol by cheap motor cars is superior to horse patrol, and that the next few years will see a greatly increased use of such cars in fire protection work.

*Comparison of Costs*

During 1915 the patrol in the Coldstream Guard District was by horse-drawn buggy, while in 1916 it was by a Ford car. We have had, therefore a good opportunity to study the comparative efficiency of the two methods, especially as the two seasons were quite similar in weather conditions.

The Guard with the car travelled in 1916 a total distance of 3496 miles between May 1st and Sept. 30th. Of this, 2321 miles were on straight patrol and 1175 were on improvement work. In 1915 the Guard with a horse and buggy, in the same district patrolled 1898 miles and travelled 74 miles on improvement work.

These mileage figures alone do not show the full saving of the car over the horse drawn vehicle. The Guard with the car took twenty-eight days less time on patrol than the 1915 Guard. Of course the object of patrol is to be always covering as much territory as possible and not a definite task of a certain number of miles. But this year and in 1915 it was not necessary to patrol continuously, and many short periods were open for other work. The 1916 Guard was able to take advantage of these short periods to a far greater extent than the 1915 guard and saved twenty-eight days, for improvement work out of the same period of patrol.

This saving of time means a saving of money to the extent of his salary and expenses for the period and a forwarding of the improvement projects of the District by twenty-eight days' work.

THE MOTOR CAR IN THE FOREST

**Manager Sorgius of the St. Maurice Forest Protective Association uses a Ford on any path where the stumps are six feet apart.**

The actual saving of patrol by auto over horse vehicle, employing a man with each to patrol the same district is thus rather hard to measure directly in dollars and cents.

So far we have figured only on the basis of using an auto patrolman, instead of a horse patrolman, in the same district. Using these figures, it needs little imagination to see the revolution motor cars will make in Forest Protection work when protection districts are apportioned according to the efficiency of the motor patrol force. If motor patrol alone is used, where roads are good and plentiful enough to allow of such action the ordinary staff of guards can be cut in two, allowing of greater concentration at the times of greater danger. This is one of the very important points in favor of the use of motors.

### *Taking Care of Permits*

The ideal method of using cars for patrol would seem to be to place a small force of patrolmen or guards on duty early in the spring and supply them with light cars. They could take care of all permit issuing and other protection work up till the first dangerous period. More patrolmen could then be added, and at the top of the danger season, the field force, owing to the saving effected in the early part by the smaller staff would be greater than ordinary. This would cut down to a very great extent, the area of each patrol district and reduce the chance of fires getting out of control.

At the start of the 1916 fire season we decided that the best way to figure the saving effected by the motors used by the District Forester and Rangers would be to compare the cost and time taken of each trip made with the motor with the cost and time that would have been taken using the existing means of travel. This system shows clearly, I think, and most conclusively, the tremendous saving in efficiency and actual cash effected by the use of cars by the supervisory staff.

The amounts saved are as follows:

| | | |
|---|---|---|
| District Forester | 45 dys. | $447.78 |
| Ranger (auto) | 12 dys. | 365.00 |
| Ranger (Motor-cycle) | 14 dys. | 136.71 |

Considering the short period of seven months from April 1st to October 31st, during which this saving was effected, the figures quoted above are conclusive evidence in themselves of the superiority of cars for supervisory work.

In 1917 we hope to have at least five cars in use and maybe more. We shall then, in case of a bad fire season occuring, have a control of the situation that under the old conditions would be entirely impossible.

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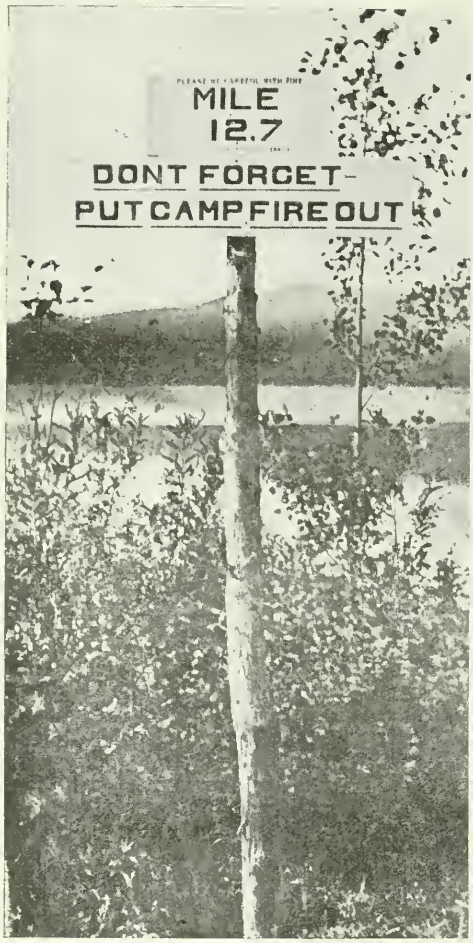
At the direction of the King, Spain has passed a law providing for National Parks. The measure also provides for the better protection of the fauna and the flora, according to an announcement of Consul General Hurst at Barcelona, and for a publicity department to better acquaint the traveling public with the scenery of Spain.




The necessity for protecting the timber areas of northern British Columbia is full realized by the Provincial Forest Service and one district vies with another in initiating new methods of directing the attention of the public to the forest fire danger. The Hazelton Forest District has broken new ground in this respect by erecting sign-posts, which, in addition to indicating the direction and distances, bear also such legends as "Please be careful with fire," and 'Don't forget—Put Camp fire out,' etc.

### FROM EDMONTON

Edmonton, Can., Feb. 13, 1917.

Canadian Forestry Association:—

"I am quite interested in the work of the Association and am becoming more so as I get information regarding same." A. S. M.

## NEW SPECIES BARK BEETLE DISCOVERED

What is apparently a new species of destructive bark beetle has been brought to light by Mr. Fritz Johansen, now of the Natural History Branch of the Geological Survey, Ottawa, who has spent five years in Entomological investigation in the extreme north, part of the time in Greenland.

Mr. Johansen, in the fall of 1916, found on the Coppermine River a small area of damaged white spruce in which bark beetles had been at work. Three different species were found, one of which is believed to be new to the science of Entomology. The opinion of other entomologists is being sought, but thus far Mr. Johansen's claim is well supported.

## FORESTRY JOURNAL ON PULLMAN CARS

By an arrangement in which the Grand Trunk Railway System gave generous co-operation, the Canadian Forestry Journal will henceforth be placed in special binders on fifteen of the company's cars for general reading. The magazines in the Chair and Sleeping Cars are read by many thousands of travellers annually and the opportunity of bringing to their attention the cause of forest conservation is much valued. Negotiations for similar favors from the Canadian Pacific and Canadian Northern railways are under way.

### A LUMBERMAN'S VIEW

Ontario, Feb. 14, 1917.

Canadian Forestry Association:—

"In the belief that the work that is being carried on by the Canadian Forestry Association is in the truest sense patriotic we have pleasure in enclosing herewith postal note for five dollars. Permit us to express our best wishes for continued and increasing success in the work."

F. S. P.

# Ontario Plans to Stop Fires

## Minister of Lands and Forests Gets Legislatiue Approval for Progressive Scheme of Fire Elimination.

Ontario's new plan of Forest Fire Prevention was announced in the Legislature on March 6th by the Minister of Lands and Forests, Hon. G. Howard Ferguson. The Minister stated that the North country would be divided into three districts according to transportation facilities, each under a supervisor who in turn will have charge of five chief rangers and a ranger staff. The entire direction of the forest protection staff will be in the hands of Mr. E. J. Zavitz, Provincial Forester. An interesting detail of the Minister's announcement was that returned soldiers or men who had volunteered for active service would have the preference when appointments in the Department of Lands, Forests and Mines are being considered.

The Provincial Forester is invested with wide powers. To his discretion is left the elimination of all fire hazards in forested districts, such as slash in a logging area or on a settler's clearing. Failure to carry out the orders of the Chief Forester gives him the right to undertake the precautionary measures on behalf of the Department, charging the cost against the holder of the property.

The Bill definitely adopts the principle of a settler's permit provision, making it obligatory for those clearing land in areas (to be specified) to take out a permit from a government officer before starting to burn debris.

The fact that the Bill at the present time leaves much to the discretion of the Minister and the Chief Forester is a strong point in its favor for the reason that it would be impossible to lay out the boundaries of those sections of greatest hazard without several years' experience. The Bill is in an elastic form and depends for its effect upon the good judgment and thoroughness of the new forest protection staff.

The protests of many of the Northern Ontario municipalities respecting the nuisance of uncleared lands, close to the municipal borders, which have been in all too many cases held by speculators with small regard for the safety of surrounding property are effectually met. Henceforth the owner must clear his land at the bidding of the municipality or Provincial Forester or the work can be done without his consent and the charges collected in court.

Mr. Zavitz commenced the organization of his staff several months ago and has made an excellent beginning in the choice of skilled men to fill the posts of supervisors in the three divisions mentioned by the Minister.

It is note-worthy that the Minister of Lands, Forests and Mines told the members of the Canadian Lumbermen's Association in Toronto last month of his intention to take over the entire responsibility for forest protection work in the Province. The Minister made it very clear that he intended to give the Forest Protection Branch charge of the fire ranging system on licensed lands and to meet the cost of this he proposed a fire tax of one cent an acre. This amount, he said, would give the licensed lands a uniform and competent plan of fire patrol with provision for permanent improvements. The Chief Forester would have authority over the rangers on the timber berths and would so organize them as to secure the maximum value from their services to both the licensee and the province.

Mr. Ferguson said that he did not believe the proposed tax would be regarded as excessive, as some of the

limit holders were paying almost as much for "protection" that did not protect.

The question of a new fire tax in Ontario with full government control of the ranger system was taken by many of the licensees with perhaps a smaller degree of joy than Mr. Ferguson's address seemed to predict. It is true that some are paying as much as five dollars a square mile for ranger services. Many others are paying probably not even one dollar a square mile; in other words, are giving their timber lands the minimum of fire ranging service. Several of the largest timber berth owners informed the Canadian Forestry Journal that while the new tax as proposed by the government would run their fire protection costs from $5 to $6.40 per square mile, they would consider the arrangement a profitable one if the Ontario Department sincerely undertook to remodel the present patchwork on licensed lands and give them a well-organized and closely inspected plan of fire protection. Those licensees who have sincerely sought to protect their Ontario lands are often met with a situation where fires have crossed from unprotected territory, taking enormous toll of property in itself well guarded.

# Manitoba's Chance for "Thrift" in Fires

The Manitoba Government is now considering specific recommendations for better protection of the forests, submitted by the new Fire Commissioner, Mr. A. E. Ham, who is also Insurance Commissioner, for Manitoba.

Mr. Ham's report, now before the Legislature, contains a highly important reference to fire prevention in the timbered areas of northern Manitoba.

*Amendments to Fire Act.*

"Some immediate amendments to the Fire Prevention Act are recommended by the Fire Commissioner, among them being the following drafted by the Canadian Forestry Association :

1. Defining the wooded districts of Manitoba and making it compulsory at all times to have a permit to set a fire in same or within six miles of a forest reserve. 2. Such permit to be given by a Dominion forest or fire ranger, or special fire guardian appointed by the minister. 3. Permit to be refused, if on account of conditions, the season is considered specially dangerous. 4. Minister may appoint special fire rangers or any Dominion forest ranger to be authorized to grant permits. 5. Game guardians ex-officio to be fire guardians. 6. Fire guardians to be given power to arrest without warrant any person found violating any provisions of the Act. 7. Burden of proving that the requirements of this Act have been complied with shall be upon the defendant.

The above are in accord with the policy advocated by the Canadian Forestry Association, Commission of Conservation, and other public bodies interested in the maintenance of natural resources for the people of the West. The large Western membership of the Canadian Forestry Association has worked energetically and unselfishly to stir up support for the better control of fires in the forested areas, so that some months ago practically every Member of the Legislature, Cabinet Minister, newspaper, and public body was informed as to the purpose of proposed legislation.

It is believed that the Government of Manitoba will give this measure hearty and prompt support. Meanwhile, no effort should be spared by our Manitoba members to inform members of the Legislature that public sentiment stands behind the amendments as proposed by Mr. Ham.

# Returns on Timber Investments

*By Wm. B. Greeley, Assistant Forester, U.S. Forest Service.*

The "ifs" in timber ownership in the West grow out of the vast extent of its forests, their distance from the large consuming regions, and their abnormal rise in value. Speculation in quantities of public timber, cheaply acquired, and the push of sudden development carried timber values very high. Borrowed money was used freely. Tax burdens rose with the price of stumpage. The interest and taxes paid out on timberlands held over long periods may thus mortgage liberal advances in future worth.

On the other hand market values of stumpage have stood still for eight or nine years, and even declined in 1915. Western timberlands have been overcapitalized more or less, and can hardly earn in the long run the profit expected of them. The large speculative gains in buying stumpage which have tided lumbermen over many tight places are mostly over. The future earnings of the industry probably will have to be made in its milling and merchandising.

Southern pine timberlands have travelled much the same road, but at a slower pace and with less striking results.

## *One Sunday Edition Eats 15 Acres of Forest*

In an address delivered at Vancouver before the first meeting of the Canadian (Pacific) branch of the British Society of Chemical Industry, Dr. R. H. Clark, M.A., Ph.D., of the University of British Columbia, made the following reference to the forest wealth of British Columbia:

"Lumbering is our third greatest industry. The United States forest service has estimated that in from twenty to thirty years their forests will be depleted. In Canada and the United States we use 500 feet per capita per annum against 60 feet per capita in Europe.

A single issue of a New York newspaper's Sunday edition requires fifteen acres of forest.

The waste of our timber resources is due to fire, careless logging, wasteful mill operations, and overproduction. In all, it is claimed 75 per cent. of our forest products are wasted, 20 per cent. of the log (the upper part) is left in the woods to rot or burn, and one-third of the slab residue is consumed in refuse burners. The importance of the forests arises not solely from their being the source of our timbers but, still more important, because of their bearing upon our water supply. In forest cover not only is erosion impossible, but the rains evaporate more slowly, the snows melt less rapidly, the run-off is gradual, floods cease, and streams are available for water power. 'When the forests fail, every man, woman, and child will feel the pinch.' The problem has been solved in Europe. The forests of Germany are 300 per cent. better than seventy years ago, and the yield per acre sevenfold what it was. Let us agitate to have the same problem solved here while there is plenty of time."

# How the Forest Animals Are "Snapped"

Photographing by flashlight is one of the more recent advancements in the field of picture-taking which has helped to secure for photography a permanent place among the arts. Paul J. Rainey, the explorer and hunter of wild animals, proved several years ago at the first exhibition of his wild animal flashlight pictures taken in Africa, that this class of photography offered a virgin field to the manufacturer of apparatus and to the man behind the camera. Soon after this there was an awakened interest in animal film shooting in preference to gun or trapshooting.

At the present time photographic flashlight apparatus has been developed to a point where guesswork is eliminated and where it is possible to photograph any object in motion. To do this it is necessary for the camera to catch the object in motion just at the instant when the flash powder is giving forth its brightest light. This requirement calls for a high-speed shutter to stop the motion on the plate of the object being photographed. With a flashlamp recently perfected by William Nesbit, the shutter is automatically snapped at exactly the moment when the light from the flash powder is most intense. His apparatus has been widely used to take flashlights of wild animals in their haunts and has given uniformly good results.

### *Must Act Quickly*

When flash powder is ignited it does not burn up or explode instantly, as might be supposed. It burns more and more brightly until it reaches its point of greatest brightness, from which point on it dies down until it goes out. This whole operation takes at the most one-fifth of a second. However, good pictures will be obtained only if the camera is snapped during this fifth of a second, when the flash powder burns the brightest.

On the other hand, this point can never be definitely determined before taking the picture. It changes for different powders and also varies for the same powder, since the powder may become slightly damp and will not burn in the same way. It is evident, then, that to snap the camera at precisely the right moment is not so easy as it might appear.

The flash lamp devised by Mr. Nesbit consists of an aluminum container to hold the flash powder, a cover for this container, a mechanism to fire the powder, and an attachment which will automatically snap the shutter of the camera at the moment when the flash powder is burning brightest. The unit is waterproof and so compact that it can be readily attached to a tree or other convenient support.

### *Tie Wire to Bait*

The flash powder is placed in a box made waterproof by a coat of paraffin and is then placed in the space provided for it in the flashlamp. The powder is fired either by a blank cartridge or by an electric spark furnished by a dry battery. A firing-pin, controlled by a spring and a trigger, simi ar to those used in a rifle or revolver sets off the cartridge.

When taking a flashlight of an animal, a wire is attached to the trigger and then tied to bait of some sort. The animal is attracted by the bait, and if it touches it, the wire is pulled, which, in turn, pulls the trigger, releases the firing-pin and ignites the powder by exploding the blank cartridge. When the powder is to be ignited electrically, a wire is stretched from a switch to the bait. Once the bait is touched a circuit is closed and an electric spark sets off the powder.

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## "VALUABLE PUBLIC SERVICE"

Regina, Sask.

Canadian Forestry Association:—

Enclosed is my annual fee. The Association is doing valuable public service in pressing campaigns for safety in the forested parts of Canada.

N. F. B.

# Slash Disposal as a Commercial Proposition

## The Actual Working Out of Debris Destruction on Crookston Lumber Company's Extensive Limits.

*By B. W. Lakin, Sup't. Crookston Lumber Company, Bemidji, Minnesota*

*Editor's Note.* — The following paper was prepared by Mr. Lakin, with a view to placing matter-of-fact evidence before the lumber firms of Eastern Canada.

I was asked to tell you how we burn our brush or slashing, in Northern Minnesota. All I can tell you is that it has been the policy of the Crookston Lumber Company at Bemidji, Minnesota, for the past 10 years to burn the slashings in the spring on the lands we were logging.

In doing this we endeavor to do it in as economical and efficient way as possible, and it has become such a system with us that we consider the benefits more than overcome the expense. Our brush, or slash burning, is all done in the spring, and early before the fire is liable to spread to adjoining lands, as early spring fires will not run in standing timber.

Our country is rolling with practically no stones. We are logging white and Norway pine, spruce, tamarac and balsam; about 75 per cent. white pine, 10 per cent. Norway, 10 per cent. spruce and 5 per cent. tamarac and balsam, with an average of about eight thousand feet to the acre.

### *Future Values*

We take of the above mentioned timber everything that will make a log 6 inches at the top end and 10 feet long. There is still left on the land a great deal of other kinds of timber, such as white birch, poplar, maple and elm, and in burning we are anxious to save all the timber left standing to be sold later with the land.

We own nearly all the lands from which we are cutting timber, and after the pine timber has been removed our land is valuable for agricultural purposes and we are careful to preserve the timber left, as well as do away with a serious fire risk.

Now we start out logging with the *IDEA* in mind that the *brush is to be burned.*

In sawing the timber we use a crew of four men—two for the saw, one to undercut and mark the log lengths, and one to trim off limbs and pile them. Then in the spring, as soon as the snow is off, we send our men in to burn the slashing. They, as a rule, do not have to do any more piling of the brush, and we are careful not to wait until it gets too dry. If there is any danger of the fire leaving the land we are operating on, we first burn around the outside of the slashing. We find that by burning early and with care, that the fire does not injure the standing timber, nor does it materially affect the small undergrowth. Where a tree has been felled off by itself, we do not attempt to burn the brush, for it alone constitutes no fire risk.

### *Burn Before May First*

We have a State law that requires that the brush be burned before May 1st, and we find, from experience, that unless it is a very late spring, that it is unsafe to burn after that, and if we do burn after that it is done under the supervision of the Forest Ranger, and special care is given that the fire is not allowed to get beyond control.

The manner in which the burning is done all depends on the instructions sent out from the main office. if you instruct your men to be careful they will, no doubt, do it, but if you issue

instructions that the brush be burned as cheaply as possible, you will have some big fires that will do a lot of damage—that we know from experience, for, even in the fall of 1909, when we had such disastrous fires in Northern Minnesota, there was no trouble, or damage, at any of our operations, though we log over 10,000 acres each year.

Our law has worked out very satisfactorily to us. Our men are all instructed to co-operate with the Forestry Officials, and we have had a great deal of help and advice from them, and never any trouble. But, to do right, you must give it considerable supervision, and have it in mind during all your logging operations, and do not wait until too late in the spring to do your burning, or you are liable to have a fire you cannot control.

We use Lidgerwood cable-way steam skidders in most of our operations, and horses and Logging RR in the balance. We are doing no hauling with logging sleighs. We use the same brush burning methods at all our operations.

*The Expense*

The expense is not great. It need not cost to exceed 50 cents per acre, and the average need not be over 10 to 20 cents per acre to do the burning in the spring.

Our men use a kerosene torch made out of 1½ inch gas pipe, with a cap on one end and a reducer from 1½ to ½ inch with a piece of ½ inch pipe, about 10 inches long in it on the other end, filled with wicking. The large pipe filled with kerosene will make a torch that will last two or three hours, and is easily handled.

In conclusion, would suggest, that to do the burning successfully and cheaply, that you must arrange your work with the idea in mind of burning that slash *right*. Co-operate with your Forestry Officials. They will always have some good ideas that you can use to advantage, and after you have burned the slash successfully for a season, you will not care to go back to the old system of leaving the slash as a fire trap.

The new Chief Forester of British Columbia: Mr. M. A. Grainger.

## HOW N.B. TIMBER SELLS

A sale of New Brunswick Crown lands was recently held at the Department of Lands and Mines and some spirited bidding resulted when five lots were offered for sale. Each lot brought more than the upset price. A. R. Slipp, of Fredericton, N.B., purchased a timber berth of two square miles on the east of the Penniac River, York County, for $40 per mile. A lot of two square miles, situated east of Magaguadavic River, was sold to Mr. Robert H. Little for $150 per mile, and two lots, one of three square miles, and situated east of Queens—Westmoreland County line, and another of four and a half square miles, situated west of Queens–Westmoreland County line, were sold to Mr. W. G. Fenwick, who at present holds the lease. The first of these lots was bid in at $180 per square mile and the second at $295 per square mile, after some strong bidding. The last lot sold produced some of the most spirited bidding of the sale and was bid in by Sayre & Holly for $301 per square mile. This lot is situated at the head of Borth Forks, Canaan River, and was formerly leased to Mr. W. G. Fenwick.

# Upper Ottawa Adopts Modern Protection

After negotiations covering two years, the territory known as the Upper Ottawa has been organized for fire protection purposes. Instead of a distinct association being formed, the 15,000 square miles have been added to the territory, nearly as large, hitherto patrolled so successfully by the Lower Ottawa Forest Protective Association of which Mr. Arthur Graham is Chief Inspector. The enlarged area will be under "The Ottawa River Forest Protective Association" in which licensees of both regions will be represented. Mr, Graham continues as Chief Inspector, Mr. Frank Hawkins being Secretary. The territory will have two main divisions "Eastern" and "Western". the former representing the old Lower Ottawa region. There will be five territorial divisions each with an inspector, with one or two supervisors looking after them.

As the Upper Ottawa presents some special problems, motor boat patrols will be used on the Quinze, Kippewa, and Hurricanaw districts. The same general scheme of organization as applied to the Lower Ottawa Association will extend to the new territory, which runs as far north as the boundary of licensed Crown lands, and has its western limit at the Quebec-Ontario border.

The Upper Ottawa contains probably the most valuable white pine stands in Canada. Sections of it have suffered severely by fire from lack of a uniform protective system.

# New Protective Association

Another forward step was registered on March 6th, when the Southern St. Lawrence Forest Protective Association was formed. A meeting of the interested limit holders was held at Quebec City, with Hon. Jules Allard, Minister of Lands and Forests, present to assure the members of the Government's desire to give thorough co-operation. Mr. Gerald Powell was elected president of the new association and the directors are as follows: Simmons Brown, E. A. Rockett, J. Tobin, Angus McLean, David Champoux, Major Lyons, Charles McClay and R. L. Montgomery. Mr. Ellwood Wilson, President of the St. Maurice Forest Protective Association, was in attendance.

## "HIGH COST OF LUMBER"

"Personally, I believe the high cost of lumber is here to stay. The present prices may seem high, but in a good many instances I am inclined to think they will go higher. Taken as a whole, the lumber manufacturer for the past ten years has been conducting his business on a narrow margin of profit, and in some cases at a considerable loss."

The foregoing forecast was made by Mr. A. C. Manbert, responding to the toast of the "Manufacturers" at the first annual dinner of the lumbermen's section of the Toronto Board of Trade, held in the assembly room of the Board of Trade. Mr. Manbert said that at present the stocks were too scanty to meet the increased demand, with the result that some manufacturers preferred to be out of the business, rather than in it.

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Two boys recently convicted in a Los Angeles court of leaving a campfire burning in the Angeles National Forest, were sentenced to visit the scene of a forest fire near Newhall, Cal., where 400 acres were burned over and property to the value of $100,000 was destroyed, and to make a study of the damage, done. Six months later they are to report to the judge and tell him whether they have done so and what lessons they have learned.

# New Brunswick's Future Policy

The defeat of the Murray-Government in New Brunswick and the success of the Opposition under W. E. Foster will probably have no unfavorable effect upon the important forest conservation projects in which the province engaged under the late Hon. Geo. J. Clarke. The forest survey and land classification schemes now so far advanced are too strongly entrenched in public approval to permit of interference from any quarter. It is believed that the new premier is well acquainted with the valuable features of the progressive forestry policy which waited so many

Mrs. Tim-Ber: "I'm hoping they'll let the Forest Family help along this 'Thrift' campaign that's advertised."

Mr. Tim-Ber: "Good idea! We've been giving the Fire Fiend more than six million dollars a year. The Governments can bank that money if they say the word."

years to get a start, and will gladly give it approval and support.

With the forest survey and land classification completed, New Brunswick will have a first-rate inventory of its two main resources. The real task of building a forestry policy will then require the utmost care, if the timber assets are to be administered on the basis of permanent yield. No consideration, however, should be allowed at this time to place the slightest obstacle in the way of the survey, which Mr. P. Z. Caverhill is directing. To do so would be to throw the province back into the dark ages of forest administration.

The completion of the forest survey, however, need not hold back a modern fire prevention policy, which New Brunswick imperatively needs. The late Government was definitely committed to a reorganized fire protection plan in the timbered areas. The new government can place before the Legislature no more statesmanlike undertaking than to erect a barrier against needless fire losses in much the same way as Ontario is now doing. Elimination of fire is surely non-controversial. There can be no 'Opposition criticism' in the New Brunswick Legislature to a sensible and thorough scheme to overcome the annual havoc of flames.

The Canadian Forestry Association will probably hold a Maritime Province Convention shortly after the conclusion of the war. It is earnestly hoped that the assembly will be able to speak of New Brunswick forestry conditions as comparing creditably with those of any other Province in the Dominion.

## How to Plant on the Prairies

"Farm Forestry" was the subject of an interesting address by Norman M. Ross, chief of the tree-planting division at the Dominion government forestry farm at Indian Head before the Manitoba Horticultural and Forestry Association at Winnipeg.

Mr. Ross said that the three motives which prompted a farmer to plant trees are (1) for windbreaks; (2) for ornamental purposes; (3) for woodlots where trees are grown for the material they may produce.

"Everywhere we go," said Mr. Ross, "in the country we see the results of haphazard tree planting. In summer the garden plots so overshaded with trees that no vegetables or small fruit will grow, and in the winter, lanes so drifted with snow between the trees as to make them almost impassable." He urged that careful thought and preparation as to location and arrangement of the trees was the first step in tree planting; if possible a plan should be drawn to scale to embrace all the grounds to be set aside for buildings, gardens, ornamental grounds, roads, tree belts, etc., and this plan adhered to.

*Tree Belts*

The tree belts, Mr. Ross said, should not be more than 10 to 15 feet wide, for unless they are protected with snow breaks they are liable to be broken down in the centre with the heavy snow; for the same reason it is not well to plant trees very close around buildings as the snow has a tendency to drift up in the middle.

The tree planting should be done gradually, too much should not be attempted at once, every year a piece of land should be thoroughly summer-fallowed for planting the following spring and no more than can be comfortably handled should be planted each year. If this method is followed, in the course of a few years the original plan will be completed and the disappointments and discouragements which inevitably follow rash and haphazard planting, will be avoided.

Mr. Ross said that he had no hesitation in advising deep summer fallow in every case, and while in a few in-

stances plantations have been known to thrive when planted on stubble, it was the exception and not the rule; and to plant trees on either breaking or backsetting invariably proved to be disastrous.

*Varieties*

For the purpose of shelter, the prairie farmer is limited practically to a choice of maple, ash, elm, birch, cottonwood, Russian poplar, willows, Carragana and certain evergreens, as white spruce, jack pine and Scotch pine. It is always advisable to mix several kinds of trees in belts where a number of rows are being planted, for instance the poplars and cottonwoods should be mixed with some slow growing variety of tree, to form a sort of undergrowth, as the poplars grow so rapidly that they soon become open at the bottom and would not throw sufficient shade to kill our grasses and weeds. Again, less damage is liable from insects or disease in a mixed belt; this was illustrated last summer when every poplar and willow was stripped by the poplar leaf beetle, but the insects did not bother the maple, ash nor elm. The same thing happened two years ago when the green aphis was so bad, the maples were absolutely denuded, but very little damage was done to other varieties of trees, and in the mixed belts it was noticed that the maples suffered less than they did in the belts entirely ofmaples.

*Spacing*

On the question of spacing there are varied opinions. The forestry branch at Indian Head requires a uniform spacing of 4 by 5 feet, this distance appearing to give the best results under average conditions. This matter, however, is of secondary importance to that of keeping the surface soil beneath the trees well cultivated, and free from grass which is the worst enemy of our tree plantations. Even after the trees are well grown and the foliage dense enough to choke out all such weeds and grasses, it is an excellent practice to keep a strip of from 5 to 8 feet thoroughly cultivated all around the outside edge. Thus, if the trees are kept in a strong, healthy condition, they will be better able to withstand the ravages of insects, rabbits, fungus growths, disease and winter killing. A year ago when the aphis caused the death of so many maples, Mr. Ross said that he himself did not see a single example of trees being entirely killed where the surface ground around them had been properly cultivated.

## PROBLEMS IN QUEBEC

Mr. W. C. J. Hall, superintendent of the forest protection branch, Quebec, speaking at the Forest Conservation Conference at Montreal, on February 2nd, gave a very interesting discussion of the forest guarding problem in the province. There was, he said, a large strip of land, consisting of many million acres, over which the department had a certain amount of influence. In the rear of that was 70,000 square miles of crown lands, on which they concentrated their efforts, while in the rear of that area again were 100,000 square miles of territory which was difficult to deal with. Of the 70,000 square miles there were 25,000 under the co-operative system. They had now obtained the united assistance of the government, limit holders, and the public. Forty-five thousand square miles were under the individual system, and this included some notable examples of efficiency—Mr. J. R. Booth, who looked after his limits as well as any association; the River Ouelle Pulp and Lumber Company, and the James Fenderson Company. There were, however, some slackers. During the fiscal year 21,000 acres were affected by fires; since then there had been some large fires, but not so extensive as had been reported. There was only one railway line which was not under the control of the department. A great improvement was shown in railway matters, the companies meeting the department more than half way; no one could say that the railways in Quebec were now a menace to the timber lands. He believed that the debris on colonization roads could be burned without danger to the forests.

FARMING NO LONGER POSSIBLE
Land which formerly sold for $600 an acre has been rendered worthless by the deposit of sand, gravel, and bowlders brought down the year after a severe fire in the mountains shown in the background. Previous to the fire the stream bed had been an inconspicuous wash carrying only a small amount of water even in the rainy season.

# Farms, Forests, and Erosion

## A Lucid Explanation of the Costly Consequences to Farming of Ignorant Forest Stripping.

*By Samuel T. Dana Assistant Chief of Forest Investigations, U.S. Forest Service.*

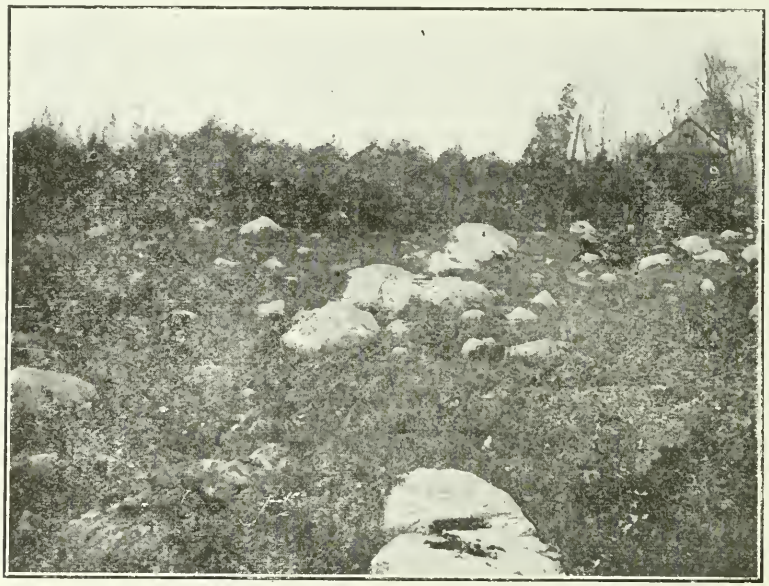
"Farms, forests, and erosion" may sound like a queer combination, but as a matter of fact the three are closely connected. Erosion is one of the most serious dangers that threaten our farms, and forests are one of the most effective means of preventing erosion. How true this is would be most startlingly demonstrated if all the forests of the country were to be wiped out overnight. Imagine how the water would pour off the mountains, cutting to pieces and washing away the land and destroying other property in its path.

The forest is, in fact, one of the best friends of the farmer in protecting his land from erosion and consequent damage. Just what this means, not only to the farmer, but to the Nation as a whole, becomes clearer when we remember that over half of the population of the country is rural: that there are more than 6,300,000 farms; that there are nearly 897,000,000 acres of farm land with a value of approximately $28,500,000,000; and that the annual production of farm crops is valued at some $5,500,000,000. Anything that

exercises an important influence on interests of this magnitude is unquestionably deserving of the most careful consideration.

### *What Becomes of The Rainfall?*

When the Pilgrim fathers landed at Plymouth Rock in 1620 they found the new continent clothed with an almost unbroken expanse of virgin forest. Cool springs were abundant, streams ran clear, and excessive erosion had not left its mark upon the land. The geologic processes of land sculpture which have been going on since time immemorial were of course at work carving out the hills and valleys. Every year the soil on the steeper slopes was creeping a little farther on its way to the sea; every year there was some change, however imperceptible, in the appearance of mother earth. At the same time another process was going on. Rocks were being decomposed and transformed into soil. This second process, though it, too, was slow, was in most places proceeding faster than the other. Soils were being formed more rap-

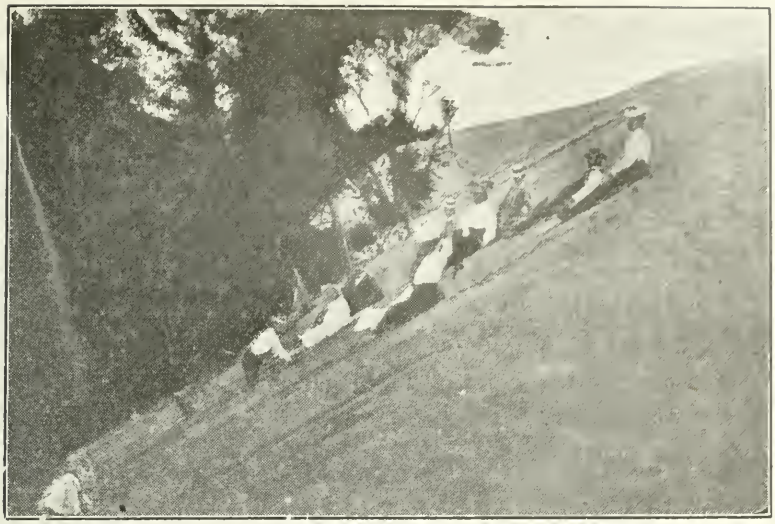


"KILLING TWO BIRDS WITH ONE STONE"
A piece of 'agricultural land' in Quebec, which the settler abandoned after destroying the only natural crop—timber.

idly than they were removed, and the basis for the future farms of the country was gradually being built up. Such soil as was washed away consisted of the lighter particles, much of which, being deposited farther down in the more level portions of the streams, helped to build up the fertile alluvial plains. The entire action of nature was beneficial, rather than destructive.

### *An Enormous Vegetable Sponge*

Everyone who has been in a dense forest during a heavy storm knows how thoroughly it protects the soil and stores the water. The force of the rain is broken by the trees, the underbrush, and the litter on the ground, so that it does not beat upon the soil. Much of the precipitation reaches the earth by running down the twigs and branches. In a light shower nearly all of the rain may be intercepted by the leaves of the trees, so that one can stand in the forest without getting wet. Even in a heavy rain the water drips down so quietly as to have practically no beating effect upon the soil. There is no perceptible surface run-off until great quantities of rain have fallen. Instead, the water is soaked up by the organic matter, or humus, in the upper layers of the soil. This is really an enormous vegetable sponge



TOBOGGANING IN SAND
A scene in Prince Edward County, Ontario, where the stripping of tree life created a costly problem in the creating of sand dunes.

capable of holding several times its own weight of water. As the rain falls it is absorbed by this sponge, then passed on to the reservoir of mineral soil beneath, and finally fed out gradually to the springs and streams. Then, too, surface run-off is checked by the mechanical obstruction offered by stumps, fallen twigs, branches, and even whole trees; and percolation of the water into the soil is made easier by the network of small roots and the channels left by the decay of large roots. Even when the rain is so heavy that the soil is unable to absorb all of the water at once, the excess flows off with no erosion. Streams coming from virgin forests are seldom muddy and are subject to comparatively small variations in flow.

### *When Rain Falls on Exposed Soil*

The effect of heavy rains on the exposed soil of cleared fields is very different. There the rain beats upon the bare ground like millions of little hammers. The soil is compacted, its absorbing capacity is reduced, and first the finer and then the coarser, infertile particles are washed away. The water quickly gathers into little rivulets, then into streams, and finally into roaring torrents, all carrying with them ever-increasing quantities of soil and often stones and bowlders. Myriads of tiny channels appear as if by magic. These run together into small gullies, and the small gullies grow into larger ones. The whole area is cut up by erosion and the eroded materials carried away to cause trouble at lower elevations.

### *The Causes of Erosion*

Injudicious clearing for cultivation of land on which a forest cover should always have been maintained has been one of the main causes of unnecessary erosion. Thousands of acres on slopes too steep for successful farming have been ruined in this way. Such land has been cheap and the settler frequently has been only too ready to cultivate it for a few years until it was worn out and then complacently move on to repeat the process elsewhere. Improper methods of agriculture have often hastened the devastation. Unfortunately, this has not been confined to the area itself. Once started, erosion has progressed in both directions, washing out and burying fertile lands below and eating back into forested lands above.

Complete clearing of lands that should have been only partially cleared has had the same result. Not infrequently it happens that part of an area

can safely be cleared for farming if the rest of the area is left in forest. Failure to recognize this fact and to retain the forest where its protective influence is needed has been the direct cause of much unnecessary wasting of the soil.

### *Far-reaching Evils of Fire*

Among the many evils chargeable to forest fires, their effect on the character of the run-off is by no means the least. Their tendency is in the same direction as clearing—to decrease the amount of water absorbed and consequently to increase surface run-off and soil washing.

From the standpoint of erosion every fire on hilly land is a menace—the steeper the slope the more serious the menace. Conflagrations which completely destroy the cover are, of course, most dangerous. Even light surface fires, however, are not to be disregarded. By destroying the humus and the carpet of weeds and other plants, these tend to harden the soil and to reduce materially its absorptive capacity. Repeated fires on the same area are particularly dangerous, since they gradually open up the stand, remove all trace of vegetable matter, and may cause the soil to harden and pack so as to be almost impervious. One or two specific examples may help to make clear the damage that may be done by even a single fire.

### *Two Graphic Examples of Erosion*

On the north side of the Soleduck Valley, in western Washington, some 12,000 acres were severely burned in 1907. All vegetable growth was destroyed and all soil cover removed. Very little vegetation started in the first four years following the fire, and during these years the slopes were subjected to considerable erosion. Soil and fragments of stone were carried in great quantities to the many gulches and water courses. In November, 1910, a combination of heavy snow, followed by a chinook wind and a warm rain, caused an enormous run-off of water, carrying with it great quantities of soil and rock. This shifting mass was so great that most of the creek channels, where they struck the flat, became choked with it and built up fan-shaped deltas, in some cases several acres being covered with debris from 1 to 6 feet deep. Even now erosion on these areas is considerable, although not nearly so great as during the first few years after the fire.

In the brush-covered foothills of southern California, near the town of Piru, is a small watershed of perhaps 1 square mile known as "Nigger Canyon." In October, 1912, approximately 100 acres of this were burned over and the cover completely destroyed. The following January a series of heavy rains caused unprecedented erosion on the area. Rocks from 2 to 2½ feet in diameter, so large that they could hardly be moved by a team, were brought down by the flood. Ten acres of orange orchard near the mouth of the canyon were covered with a deposit of gravel from 6 inches to 5 feet in depth,

REPAIRING EARLY MISTAKES
Drifting sand in Norfolk County, Ontario, planted up with evergreens from the Ontario forest nursery. This land ought to have been retained permanently under forest.

so that in many places the lower branches of the trees rested directly on the ground. Though the orchard was not destroyed it was so injured that it will be necessary to reset the buried area. Four acres of bottom land which had been cleared the year previous to the fire for planting to lemons were so covered with gravel and bowlders as to be completely ruined. Local residents state that while the precipitation that winter was heavy, they do not believe it was worse than in many other years. One owner expresses the opinion that there has been more damage from erosion in the 3 years since the fire than in the 22 years before.

*Effects of Destructive Lumbering*

All cutting, of course, changes to some extent the character and amount of the soil cover and therefore disturbs more or less the natural balance between rainfall and run-off. If the cutting is properly regulated, however, this effect may be so slight as to be practically negligible. It is nearly always possible to leave sufficient cover on the ground to prevent any ill effects from the opening up of the stand, and if fire is kept out this is soon supplemented by other vegetation which effectively protects the soil from erosion.

Unfortunately, past cuttings have not in all cases been properly regulated. Considerable unnecessary erosion may be laid to destructive lumbering carried on without regard to the future welfare of the forest itself or of the interests dependent on its protective cover. Clear cutting has been practiced on steep slopes where at least a part of the stand should have been left. Roads have been so located as to be subject to serious erosion. Deeply gouged skid trails, formed by dragging many logs down the same rut, have been left unprotected to wash out after every heavy rain. Worst of all, fires have been allowed to burn uncontrolled on the cut-over areas. The dry mass of twigs, branches, and other inflammable material left after all lumbering operations adds to the fury of the flames and enables them to expose the bare soil to the mercy of the other elements.

# About Saskatchewan

**Saskatchewan covers some one hundred and sixty-one million acres of territory, one-fifth of which is water and two-fifths available for cultivation. About one-half of the Province is now surveyed, the remainder of the area is mostly unagricultural. The forest area covers some six million acres equal to the area of wheat crop in the Province during the year 1915. Therefore, the forest reserves and their resources are not a small factor in influencing the prosperity of the people. With proper protection and management their products can be made just as valuable to the community as the farmers' wheat. Excellent forage and hay are also available and several stock associations are being organized for the purpose of utilizing the grazing. Numerous timber and cordwood operations are being carried on throughout the district this winter.**

A shortage of labour has been evident all season with a heavy snow fall and a considerable spell of 30 to 50 degrees below zero weather, during January and February.

Acting Supervisor Geo. S. Smith of the Big River Forest Reserve recently visited this office and reports considerable activity by the Ladder Lake Lumber Company who are running seven camps this winter logging timber on their limits in the vicinity of Big River and cutting small timber sales on the Forest Reserve. One operator is cutting cordwood on an extensive scale, some burned timber on the limits.

A. B. Connell, Supervisor, Pasquia

Forest Reserve, has been in the East for several weeks undergoing an operation.

*$1.75 for Cutting Cordwood*

Student Assistant Snow who has been assigned to the Pasquia Forest Reserve for the past year reports considerable cordwood activity this winter on account of the high price being paid. Men are receiving $1.75 per cord for cutting in the bush.

Mr. D. N. McDonald is having a successful winter, logging operation on his timber sale.

Mr. E. L. Olsen of Weldon, Saskatchewan has been awarded a timber sale for a million feet of jack pine on the Fort a la Corne Forest Reserve and Ranger A. Vandine reports that most of material will be disposed of to the settlers to the south and west of the Reserve.

*Ranger Badly Hurt*

Ranger in Charge John McBride of the Sturgeon Forest Reserve was badly injured, having a log fall on him during the construction of a barn. Several ribs were fractured and he was injured on one side of the head. He has recovered however, and is now back at work.

The Prince Albert Lumber Company are cutting some thirty million feet of spruce on their limits in this Reserve and have four steam haulers landing the timber on the Little Red River.

Several timber sales have been awarded on the Porcupine Forest Reserve but owing to the depth of the snow, their operations have been considerably hindered.

Chief Fire Ranger Thompson of the District Office spent the month of January on the Porcupine Reserve inspecting timber sales and improvements and reports very severe weather and much activity at Headquarters in the cordwood line "Keeping the home fires burning."

Chief Fire Ranger H. Lockhart of the Battleford Fire Ranging District resigned his position recently.

The Saskatchewan motto and byword for 1917 is "Have you burned your brush?" The infection is spreading.

## CEDAR SUPPLIES IN B. C.

"It is the consensus of opinion among those who are well acquainted with the timber resources of British Columbia that the extent of the standing timber is not nearly so great as might be first supposed. The handy cedar to Vancouver is pretty well exhausted and the manufacturers of cedar shingles on either side of the line who are being carried away with the idea that there are inexhaustible quantities of red cedar in British Columbia may probably wake up some morning to find that their estimates have been too great."—News note in "The Timberman," Portland, Ore.

## TREES

(*By Stephen Henry Thayer*).

What is the wisdom taught of the trees?
Something of energy, something of ease;
Steadfastness rooted in passionless peace.
Life-giving verdure to upland and glen;
Graces—compelling the praises of men;
Freedom that bends to the eagle and wren.
Largess—expanding in ripeness and size;
Shadow that shelters the foolish and wise;
Patience that bows 'neath all winds of the skies.
Uprightness—standing for truth like a tower;
Dignity—symbol of honor and power;
Beauty that blooms in the ultimate flower!

## AN ALBERTA MESSAGE

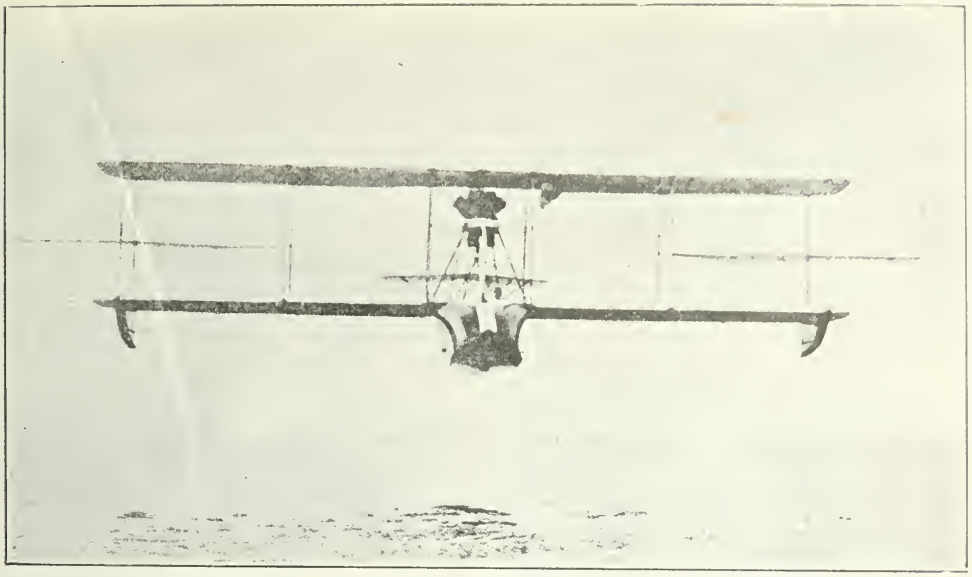
Coleman, Feb. 13, 1917.

Canadian Forestry Association:—

"Enclosed is my subscription for 1917. I wish the Association every success in the work it is doing"

T. H. Y.

Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association, will be sent on a tour of the Province, by the Department of Lands and Forests, to try to get the limit holders who are not already members of the Cooperative Associations to form new ones in their respective districts.



A FOREST PATROL AVIATOR IN WINSCONSIN CROSSING A LAKE

# The Cost of Aerial Patrol

*By Wm. T. Cox, State Forester of Minnesota*

The time has passed when flying machines should be looked upon as toys or experiments. They have been developed to the point where they are being used daily and with comparative safety. Within the past five years thousands of men have been trained to guide aeroplanes and hydroaeroplanes among the clouds with a greater degree of safety than any other kind of machine or conveyance can be driven at the same speed on the ground.

The European War is calling for aeronauts in increasing number. They are wanted to carry dispatches, to observe movements of enemy forces, and even to carry on offensive movements against the enemy. They are not only practicable and reliable as machines go, but are now considered almost indispensable for the armies.

Some years ago, when I watched the Wright brothers make the first successful flight for the Government prize at Fort Meyer, Virginia, it occurred to me that aeroplanes were certain to find a field of usefulness in forest patrol. In what other way could a large tract of forest be so quickly seen and fires detected? Since the winning of that prize at Fort Meyer, the Wright brothers and many others interested in aeronautics have been steadily and rapidly perfecting the different types of flying machines. To-day they are almost as practical as the automobile.

## *Promptness Pays*

To appreciate what the advent of the aeroplane means in patrol work, it is necessary to know what constitutes adequate forest patrol and what it costs. Let us figure a little. Ninety-nine forest fires out of every hundred can be extinguished in a few hours by one or two men if the fire is reached within half a day after it starts. That is why the rangers and their patrolmen are effective. But it costs money to maintain the right kind of a patrol force. There should be at least one man to every 72 square

miles of forest, 22 to every million acres, 110 men for five million acres. The maintenance of these men for six months at $70 per month, plus necessary equipment in the shape of canoes, tents, etc., would amount to $49,500. This is exclusive of the cost of special fire-fighting crews, and winter work to see that loggers burn their slash. Sixty thousand dollars a year, in round numbers, would be the cost of adequately protecting five million acres of forest; and, since that area of forest land represents about $100,000,000 worth of inflammable property, the protection cost—six hundredths of 1 per cent—is fairly low insurance. It would be a fortunate city government that could maintain its public fire department at anything like so low a rate. Nevertheless, by the use of flying machines even this low cost of protecting the forest can be reduced particularly in a country like northeastern Minnesota, where there are so many lakes.

*Flying Boats*

Five million acres represents one-quarter of the forest region needing patrol in Minnesota; it represents also the lake-dotted area of Northeastern Minnesota, which is peculiarly adapted to patrol by the use of hydroaeroplanes or flying boats. An aeroplane, it may be stated, starts from a fairly smooth spot of ground and must alight upon a similar clear space of ground. A hydroaeroplane, as the name signifies, starts from a water surface and alights upon water. Northeastern Minnesota, with its thousands of lakes and numerous streams, is the place above all others on the continent where flying boats can be used to advantage in forest patrol. Three hydroaeroplanes and four officers are required. The machines, allowing for a life of three years, cost $7750 a year; repairs and supplies $100 a month, or $600; two aviators, at $200 per month; two observers, at $100 per month; and a mechanic at $80 per month, cost $1080 for the six months' annual service. This brings the total expense for six months aerial patrol for five million acres to $12,430. The aerial patrol cannot entirely replace the foot and canoe patrolmen, because a certain number of men are needed at accessible points to respond quickly to calls when fires occur. The number of such men for five million acres varies from 20 to 30, depending upon the kind of season; an average force of 25 men should suffice. In other words, the use of flying boats for one season at a cost of $12,430 reduces the patrol force by 85 men, whose wages would have amounted to $38,310—a net saving in patrol cost of $25,880.

—*From American Forestry.*

## RECRUITING FROM FOREST SERVICE

Recruiting for the 230th Forestry Battalion in British Columbia exacted a further toll of the ranks, already heavily depleted, of the Provincial Forest Service. W. F. Loveland, who has been Acting District Forester in the Island Division, has received a commission as Lieutenant and is now engaged in recruiting work on Vancouver Island. He is a South African War Veteran.

E. P. Fox, of the Management Section of the Provincial Forest Service, who has thrown in his lot with the 230th Battalion, joined the service in 1913, and has had ten years of varied military experience including the Natal Rebellion of 1906.

Ranger J. E. Stillwell of Duncan, and a number of Forest Guards have joined the Forester's ranks, and rumour says that the Battalion will conduct lumbering operations on the slopes of the Pyrenees.

## SELLING LUMBER WITH A CAMERA

One of the most modern methods of selling an article is by means of the camera. To further the sale of agricultural implements, the International Harvester Company of America employs competent lecturers who travel throughout the country illustrating the development of farm machinery.

In a modest way the lumber industry of the Pacific Coast has sought to follow the successful methods of the major industries of the United States.

# Forestry Keystone of Wood Industries

## Efficiency Demands Application of Highest Economics in Handling the Raw Materials.

*By Ellwood Wilson, Forester of the Laurentide Co., before Canadian Pulp and Paper Association, Montreal.*

The question of inventories of timber resources is a very important one, for no company which is ignorant of the amount of timber it possesses can be said to be well managed or in sound condition and cannot lay out its work for the future in a business like way.

The utilization of our timber resources is still, with three or four exceptions, carried on in an old fashioned and wasteful manner to the detriment of the forest; and the logging costs of the future will be greatly raised by such methods.

As cheap wood and cheap power are vital to our industry it may not be amiss to call the attention of our members to the close connection between the removal of the timber and the impairment of the water powers. The forests undoubtedly regulate the run-off, distributing it throughout the year and decreasing the difference between extreme high and extreme low water and they probably increase the total run-off by preventing evaporation. It is said too that they increase precipitation. Therefore the removal of forests by fires and by over cutting is a great menace to the future of our industry and should be made a matter of study by a committee of this Association and recommendations made to our members.

Our members should be urged to join and form well managed Co-operative Associations for protection from forest fires.

As several of our members have begun to plant trees on a large scale the question of taxation where they are planting on their own lands should be studied. Also the question of guarantee by the government that those who plant on licensed lands will cut the trees they plant and will be properly reimbursed for their investment by reduction of stumpage dues at the time of cutting must be taken up.

MR. ELLWOOD WILSON

The government of Quebec should be urged to compel all licensees to take better measures for protection of the forests against fire. During the past season the territories patrolled by the Co-operative Associations were in great danger from fires originating on lands adjacent.

*The Right Use of Land*

Also the question of opening up lands for settlement in timber limits should receive attention and laws be passed forbidding this on lands which are unfit for agriculture. The interests of the settler and the licensee are not antagonistic as the latter needs the settlers to furnish labor for his woods operations and the former needs such work to tide him over the winter. But the settler who is permitted to take up land too poor to give him a decent living is a menace to the community; he steals timber and must trap and hunt out of season for a living and is not able to properly educate and rear his children. This is a matter which calls only for a little common sense, and new townships and parishes should not be opened until they have been examined and laid out by experts. At present settlers have only to ask for lands in certain sections to have them granted and experience shows that very often such lands must be abandoned after cropping for a few years.

The Government should also publish the work done by its Forestry Branch and should as rapidly as possible make a complete inventory of the forest resources of the Province.

A standing Committee should be appointed by this Association to study the questions of better preservation, closer utilization and perpetuation of our resources and should make recommendations to this Association for the guidance of its members. These questions which concern our raw material are vital and fundamental to our industry and have been too long neglected.

* * *

Mr. Wilson continued: The most important thing in regard to the pulp and paper industry is most certainly the raw material, and the progress which has been made in taking care of this raw material—or the source of this raw material—is lagging far behind the rest of the work that is being done. You have a good Technical Section which is discussing the chemical side of the question, but you have nobody whatever who is showing any care of your woodlands.

*Information Meagre*

Now, the woodlands of the Canadian manufacturers are only just beginning to be taken care of at this late date, as they should be taken care of. The waste in the woods is certainly very large, and the knowledge which the manufacturers in Quebec and Ontario have of their resources is, with a very few exceptions, almost nil. You have relied for years upon the reports of men, who are supposed to know the conditions. The Governments are taking certain steps which they hope will conserve the forests, but they are putting all the burden of the expense of the work on you. You are required to pay for fire protection; you are required to pay for your own maps, and are required to do some other things which, licenses and renters of lands, you should not be required to do, but on the other hand, these things are absolutely necessary and until such time as the Governments are willing to take their share of responsibility, it will have to be borne by the paper manufacturers.

I have been asked to say a few words in regard to the forest lands at the present time. This is a question which certainly demands attention, and I would suggest that a committee be appointed by this Association along the line of your other technical committees, to examine into all the things which refer to the products and protection of your raw material. This is a very important thing and such a committee could be of very great assistance and use to you.

*Careless Cutting*

In regard to the devastation of the forest lands: the cutting which has been carried on in the sections with which I am familiar, has caused a great deal of devastation, and I think we should take some action before it is too late. The indiscriminate cutting of the forests and the taking of the raw material which was the handiest and cheapest to log at the time, has certainly contributed to the low prices which you have been able to charge for your paper, but

**In the North of France, fuel gathering is now done by Women and Boys chiefly. Note how carefully branches are being utilized.**

the taking of this easily accessible supply is now practically at an end. You will be forced from this time on to go much further for your timber, and to cut it from places very inaccessible, and your logging costs are bound to increase, not gradually, but with a jump. The way in which the forests have been cut over, and the carelessness in regard to fire, which existed up to five years ago, have left waste many large districts which should have been useful to you for many years to come.

The way in which the cutting has been carried on, taking the timber from the borders of lakes and running streams has practically come to an end, and the method of cutting by which choppers have been allowed to go into the woods and practically select the timber which they were cutting and leave the rest, has left it so scattered that it will be very expensive and very difficult to cut up.

### *Competition Valueless*

The time has come when this question should be taken up and examined carefully. In the woods there is no reason whatever for competition, but as a matter of fact should only compete with each other in trying to get your logs out as cheaply as possible. This can be done more efficiently by co-operation. There is no reason why you should compete in the question of labor or provisions, but by getting together and planning your operations together, and planning them with some idea of the preservation of the forests, and you can certainly have some great economics and economies which will preserve the forests over the greatest term of years.

The scarcity of pulp wood is an important factor in the high price of paper, and these will increase from time to time, and some steps or measures must be taken to prepare the forests for the future, and also the question of the waste of material in the woods should be taken up, as the way the waste is allowed to accumulate now is one of the most serious fire hazards that we have: makes easy the starting of the fires, and the extinguishing of them much more difficult, and destroys the reforestation which you should be getting.

I would suggest that you appoint a committee to look into all these questions and take concerted action to end a condition which prevails at the present time in the woods—the logging end of your business. (Applause).

### Western Organizations Ask Better Fire Laws

The eagerness of wide-awake Western associations to co-operate in all reasonable movements to protect the forest wealth of Western Canada was shown by the action of the Western Retail Lumbermen's Association, the Canadian Credit Men's Trust Association, and the Association of Manitoba Land Surveyors at their recent annual meetings at Winnipeg.

The Canadian Forestry Association brought before these bodies the situation in which the timber assets of the prairie provinces were placed owing to lack of protection against settlers fires. The legislative suggestions offered by the Forestry Association to the three provincial governments were discussed and heartily endorsed. Resolutions were passed by each of the organizations calling upon the Manitoba and other governments to take proper means to preserve the forests of the provinces from fire ravage.

### "Twenty-Seven"—One Man's Record

In the 1916 campaigns for new members for the Canadian Forestry Association, the member rendering the most effective service was Mr. W. J. MacBeth, Lumber Manufacturers' Agent, Toronto, whose generous interest in our work prompted him to secure no less than 27 new adherents.

In order to raise our total to 6000 in 1917, it will be necessary for every member to make a vigorous personal effort. Do not postpone it until December. Start a new member on the conservation path this month.

Send us three or four names of those who might be interested in the Association, its work, and its publications. You will not be bothered further. But we do want the names. And you, knowing your locality well, are in a position to send them in.

Canadian Forestry Assoc.

### Future of Northern Manitoba

Vast resources of varied character and wide range make northern Manitoba a rich field for development according to the report of J. A. Campbell, Commissioner for Northern Manitoba, lately tabled at the legislature. Rivers and lakes abound with fish—sturgeon, whitefish, pike and trout. The water powers are enormous and widely distributed so as to be available at practicable distance from points where required for industrial development. Gold and copper ore are already being produced north of Le Pas, and further immense deposits of these minerals and zinc sulphide ore are known to exist. The fur trade of the town of Le Pas last year is estimated at a quarter million dollars. It is expected that the early future will see a movement of settlers to a district of unrivalled possibilities, the climate of which, Mr. Campbell states, is no more severe than in settled parts of the Western provinces.

In practically every item of Mr. Campbell's prophecy do we find an argument for forest conservation. The fisheries, water powers, mining settlement, fur trade, are linked arm in arm with forest maintenance Should the provincial authorities. neglect to co-operate in keeping fire out of the present tree-covered areas, the picture drawn by the Government Commissioner will not be realized.

### FROM A LUMBER FIRM

Owen Sound, Ont.

Canadian Forestry Association:—

Enclosed find cheque for five dollars as a Contributing Membership fee for this season. We appreciate the work that your Association is doing and trust that you will be able to continue it along the lines that you have in mind."

# Canada's Work in Forest Research

## The Working Programme of the Forest Products Laboratories of Canada, With Description of Some Scientific Investigations.

*Brief Excerpts from an Address by W. B. Campbell, Assistant Superintendent Forest Products Laboratories McGill University, Montreal. Delivered Before the Annual Meeting of the Canadian Forestry Association.*

At the present time the necessity of scientific research in industrial work is universally acknowledged but at the same time there is an almost universal lack of definite knowledge of what is really meant by industrial scientific research. The fact that the marvellous progress made by Germany in the past twenty-five or thirty years is due most largely to the work of her chemists leads many people to suppose that chemists need only be presented by an industrial problem and they straightway produce the solution in their laboratory. Such a view overlooks the years of patient toil and the hosts of disappointments that come to the investigator before he produces tangible results. The research leading to the substitution of artificial indigo for the natural product, for instance, took about twenty years' time of many gifted men and the expenditure of about five millions of dollars before there was any return. Such a case is not at all exceptional and differs only in degree from many other problems solved by intensive scientific research.

Many of the investigations now under way at the Forest Products Laboratories are intended only to cover the immediate problem before us but others are designed to proceed until a knowledge of the basic principles of the subject is obtained. Such, we consider, is the most real purpose of our institution. The wood-using industries of our country are not of such size as to warrant their establishing individual laboratories of this kind and if the Forest Products Laboratories of Canada can furnish to these industries scientifically accurate information concerning their materials and products and the manufacture of those products, then we of the laboratories will consider that we have not only earned our salaries but that we have done our little bit to promote the industrial greatness of Canada.

A very brief mention of a few of the investigations which are now being carried on will suffice to show what we are attempting at present, though we are considerably handicapped by the absence of some of the best of our staff who are at the front and the impossibility of getting other suitable men at this time.

Some of the leading investigations now on hand are as follows:—

A comparative study of the mechanical strength and physical properties of all Canadian woods. Tests are made on a large number of small clear specimens cut in the same way from several trees of each species selected in the forest by Forestry Branch experts. These tests are being made on the same system as a similar series of tests under way at the United States Forest Products Laboratory so that our results will be directly comparable with theirs.

and when both series are complete the data will cover all the North American woods.

A study of the comparative value and characteristics of mine timbers available for use in the coal mines of Nova Scotia. This includes strength tests and a study of the decay of such timbers both in the mines and in storage. Already considerable improvement has been made in storage conditions so as to greatly decrease the loss from rotting in the piles.

A study of the fundamental factors involved in the drying of wood and phenomena related to change of moisture content such as shrinkage, hygroscopicity, migration of moisture in the wood, heat conductivity, etc.

A study of methods looking for the utilization of waste sulphite liquor. About 600,000 tons of wood per year is consumed in the manufacture of sulphite pulp in Canada and approximately one half of that amount of organic material is thrown to waste in the liquor. The problem of finding a use for this material is a very complicated one and although a great deal of research has been done on the subject by various English, German and American chemists only results of moderate value have been obtained. At present the work of these laboratories is confined to the compilation of all available information in connection with this subject, leaving experimental work to be done later on.

A study of the fundamental factors involved in the beating of paper pulp. This beating process is a very important one in the manufacture of paper, particularly in the case of finer grades, and is one concerning which very little is known. A full understanding of the reactions involves a very complete knowledge of the colloidal characteristics of cellulose thus leading to very involved questions of physical chemistry. This research is one of the type mentioned as being of so complicated a nature as to necessarily extend over several years but is one which we are peculiarly well situated to attempt.

A study having for its object the discovery of a commercially feasible process of creosoting Jack pine and Eastern hemlock for use as railway ties.

An investigation as to the feasibility of chipping, drying and baling pulpwood for shipment and a determination of the value of chipped and dried wood as compared with round wood. There is a possibility that there may be a saving in freight effected which will make possible the utilization of forest areas which are now going to waste.

An investigation of the chemical composition of wood, particularly of those woods which may be of use for paper pulp. This work involves the testing and standardization of methods of analysis and the examination of the composition of several important species both in the green condition and after different degrees of seasoning.

An investigation of the possibility of treating prairie grown woods so as to make possible ther use as fence posts.

A study of the oils produced by the destructive distillation of wood, both resinous and hardwood, with reference to their use in ore flotation.

A study of the relative durabilities of Canadian woods when exposed to various kinds of wood destroying fungi.

A study of the fibre dimensions of Canadian woods. This is particularly important to the paper industry but is also of value in other work as well as being of considerable scientific interest.

A study of the sulphite cooking process and the factors involved in cooking various species of wood for pulp. It is hoped that a thorough study of the process from a scientific point of view combined with practical experience will point out ways in which the process can be improved.

The investigations mentioned do not include any but the outstanding problems. Besides these there is submitted to the Laboratories a continuous flow of minor questions which the laboratory equipment enables us to answer quite readily. Questions regarding the identification of wood from samples, for instance, are answered daily for people all over the country at no cost to them.

# The Nurseries and the White Pine Menace

*Concluding the Article on White Pine Blister Disease appearing in the February Issue.—By H. T. Gussow, Dominion Botanist.*

Until quite recently it was held that the stage of the rust on the currant, did not winter over on the currant, but must start anew every year from some nearby infected pine. So it was thought unnecessary to restrict the nursery trade in cultivated bushes, since they would be shipped either before or after they had been infected. And it was said that, though badly infected in one year, the same currants planted elsewhere showed no infection in the succeeding year.

This point is still open to question. But it is noteworthy that the United States, at any rate, mean to take no risks, as is shewn by an amendment to the Notice of Quarantine No. 7, dealing with the White Pine Blister Rust. The original quarantine deals with the prohibition of importation of all five-leaved pines, and is dated 21st May, 1913. The amendment (No. 1) is dated 29th February, 1916, and reads " . . . it is necessary, in order to prevent the further introduction into the United States of the white pine blister rust, to forbid the importation into the United States from the Dominion of Canada and Newfoundland of . . . all species and varieties of the general Ribes and Grossularia known to be carriers of this dangerous disease."

To come back to this question of overwintering. If one notes, on the one hand, the ever-recurrent infections, year after year, within the danger area, and often with no pine anywhere near, and, on the other hand, confronts the apparent introduction of the disease into regions, where pine rust was unknown and currant rust absent,—certainly these factors do not by any means support the general belief in the non-ability of the currant rust to overwinter.

Up to 1916 there was no currant rust at the Experimental Farm in Ottawa; close search had been made, but did not reveal any signs. But towards August of last year some fifty black currant bushes were found to be infected—some young ones in nursery rows, and some half dozen old ones close by. On enquiry, it was learned that there had been planted in spring a small number of a certain variety purchased from near Hamilton, a district in which the rust was known to exist, although no data are at present available as to whether the nursery, when these particular shrubs came, was infected by it.

Another question of importance yet to settle is whether the spores of currant rust may be carried on fruit and containers from infected areas, and thus be conveyed to areas formerly uninfected.

### *Nursery Quarantine*

If overwintering is definitely proven, and if the disease is likely to be conveyed by means of spores, then the problem would appear capable of solution by a quarantine on nurseries within infected areas, both against shrubs and against packages of fruit. This is, however, economically impracticable. The alternative—and, mark, the only alternative under these circumstances—is the complete and systematic destruction of all white and other five-leaved pines at present growing in that particular danger area. Once these have gone, re-infection of currants will not occur, for physical conditions promise to eventually wipe out currant rust, that may result from wintering over; since the virulence of the fungus is greatly increased by a continuance of its life cycle on the pine. Observations made this season by my assist-

ant, Mr. McCubbin, indicate a measure of control exercised by prevailing weather conditions.

This concludes the general consideration of the role of the Ribes species.

From a consideration of the role of these factors we can draw the following conclusions as regards control of the disease:—

(1) Exclusion of all foreign white and other five-leaved pines, which has already been done .

(2) Exclusion of all foreign species of the genus *Ribes* according to Gray's Manual, if known to be carriers of the rust, (which has already been done by the United States of America).

(3) Examination in plantations, hedges, shelter belts, etc., of all white pines originating from any foreign sources.

(4) Destruction in any such plantation, hedge, shelter, belt, etc., of each and every tree found infected even in the smallest degree.

(5) Examination of, and destruction, if possible, of *Ribes*, wild or cultivated, in the neighbourhood, where infected pines may be found; if disease be found, the area should be proclaimed as a danger area.

*Scouting Necessary*

(6) Systematic look-out, during April, May and June, for blister rust on native pines; and from June to October, for currant rust, followed by immediate report and proclamation as danger areas, wherever disease be found.

(7) Strict quarantine against the export of white pine or other five-leaved pines from any danger area.

(8) Strict quarantine against the export of currant or gooseberry stock from nurseries in any danger area, until a license has been granted by an authorized government official that neither stage of the rust has occurred on the premises of the licensee, whilst, at the same time, all pines have been destroyed throughout the danger zone.

(9) Destruction of all wild species of *Ribes* acting as carriers in the neighbourhood of valuable standing white pine timber.

(10) Planting of deciduous tree shelter belts surrounding new pine plantations.

(11) Mixed re-afforestation.

(12) Raising of pine seedlings, outside of danger areas, for future supplies from home grown seed.

The last three suggestions are made as additional and rational precautions. Shelter belts would protect against the attack of pines by disease; next, mixed planting would reduce losses in case new plantations may be invaded by disease in future; and my last suggestion is to encourage re-afforestation with young seedlings *grown in this country.*

*Duty of Dominion Government*

In order to achieve the best results from these prophylactic measures, the work should be divided. The part assignable to the Dominion authorities would be to give the required legislative support, to carry on, by means of their experts, researches into many uncertain phases of this important disease, some of which have been briefly referred to, and to act generally as scientific advisers and referees to the provinces. Arrangements could also be made for the training of provincial inspectors, if such be found necessary. The Field Plant Pathological Laboratories of the Dominion, under my direction, would affort great assistance in this respect.

To the provinces would fall the maintenance of systematic scouting inspection, the supervision of the eradication of pines or currants as the case may be, the replacing of diseased plantations by young stock, and generally the responsibility for the carrying out of the practical work in their provinces, and the soliciting of close co-operation from all interested parties.

If all these suggestions are found practicable and economically safe, it would, then, be reasonable to hope that the disease, which has done such serious damage in Northern Europe, will not prove as appalling to America's most valuable lumber tree, as was expressed some years ago by Professor Sommerville, the well-

known authority on Forestry in Great Britain. The invasion by blister rust of the Continent of America, so often predicted by many writers, has at last occurred. Our efforts to combat the attack will be watched with interest in the Old World. In our vigorous Saxon vernacular, it is up to us to show that we are able to hoe our own row, and mend our own troubles.

# New Brunswick Forest Club

About twenty men, including graduates and students of the University of New Brunswick, members of the Provincial Forest survey parties and others met at the home of Mr. P. Z. Caverhill on the evening of February first when the initial steps were taken for the organization of the New Brunswick Forest Club.

The object of the club will be to promote better fellowship between the members themselves and between the profession and those engaged in lumbering and allied industries. Speakers will be secured by the Club whenever convenient and the event was an auspicious one in the annals of forestry in the East.

Mr. Caverhill served as temporary chairman of the meeting, after which refreshments were served and these present became better acquainted. A committee consisting of G. H. Prince, of the Crown Land Department, Prof. Miller of the University and Edwin Hall of the city of Fredericton was appointed to draft a constitution and to look up the matter of incorporation the Club in the province. The next meeting was announced for February 16th, at the home of Prof. R. B. Miller. Those present as charter members of the club were: Messrs. Caverhill, Prince, Jago, Melrose, Burns, L. Webb, Williams, Brewer and Maxwell, from the Provincial forest survey staff, Hall from the Dominion Forestry Branch, and R. B. Miller, George Miller, J. Smart, Taylor, Crandall, Seely, Christie, Sutherland, H. Webb, Wheeler and Stephens, from the University.

### *Officers Chosen*

The second regular meeting of the New Brunswick Forest Club was held at the residence of Prof. R. B. Miller, on the evening of February 16th. At this meeting the constitution was adopted and the following officers elected by the Club, whose incorporation under the laws of the Province may be arranged for: Pres. Prof. R. B. Miller; Vice Pres., Mr. P. Z. Caverhill; Sec'y.-Treasurer, Mr. G. H. Prince, with Mr. Robert P. Melrose as acting secretary during Mr. Prince's absence in the field. Messrs. Gareau and Hall were elected to serve with the President as an Executive Committee. The following names were proposed as active members: John Curry, Andover, N. B.; Percy G. Burchill, Nelson, N. B.; Colby H. Jones, Apohaqui, N. B.; Walter W. Gleason, St. George, N.B.; Reginald R. Bradley, St. John; and W. B. and Harry Snowball, of Chatham, N. B.; also Col. T. G. Loggie, Fredericton, N. B.

### *Mr. Gareau's Address*

Mr. Gareau, forester for the W. B. Snowball Co., of Chatham, N. B., then gave an informal talk on his work of the past year with that company. The progressiveness of this firm is shown in the fact that it was the first to appoint a regular forester in New Brunswick and the saving that has been effected in the woods alone would seem to justify other companies in doing the same. The main saving effected has been in cutting low stumps, taking out tops to a small diameter and in marking off log length more accurately, with an eight foot pole, etc. In addition to supervision of about 65 camps widely scattered he cruised last summer about 70 square miles of timber intended for cutting operations. This has enabled the company to make better contracts with jobbers, since

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**Do You Know—**

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**You Can—**

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they know the amount of timber accurately and the distance of hauling to landings.

*Winter Survey in N. B.*

A Crown Land survey party consisting of about fifteen men started work again February first in the vicinity of Pangburn on the Transcontinental and will work towards Moncton. They report good going on snow shoes and in spite of cold weather are living comfortably in tents, hauling in supplies on hand sleds or more properly, toboggans. They will work until the spring breakup which means about the middle of April when they will come in again until the regular summer field work season.

## "HAMMERFEST" OF FORESTERS

The annual "Hammerfest" was held at the forestry camp of the University of New Brunswick on the evening of January 26th, under ideal winter conditions and an attendance of about 22 men. Among the guests were Priovncial Forester Caverhill and some of his office staff, Prince, Brewer, Melrose, Maxwell, Leland T. Webb, Edwin Hall and Colby Jones, of the class of 1916 who were in the city at the time, and Mr. McAllister of the Engineers of the University to represent that department. Two members of the Ninth Heavy Siege Battery were also on leave for the night, Lee Kilburn and Glenn Mowatt. Good fellowship prevailed and the usual toast list carried out after a sumptuous feast prepared by the "Grub" Committee whose efforts were duly appreciated. Every man is behind Mr. Caverhill in the forest survey now being carried out under his direction for the Department of Lands and Mines and the meeting was full of the spirit of optimism and co-operation.

## PROCESS TO UTILIZE MILL WASTE

Dr. J. G. Davidson, of the University of British Columbia, in cooperation with Lloyd L. Davis, of the department of industrial chemistry of the University of Washington, has discovered a process of distilling sawmill waste whereby it is believed that thousands of dollars now lost will be saved.

By means of this process tar, a light oil, acetate of lime, and charcoal are formed. The gas produced by distillation is carried through a pipe nine inches in diameter and twenty feet long. In this pipe is an electrically charged wire, which causes precipitation of the heavy particles of tar. The tar, forty gallons for each cord of wood distilled, is of medium consistency, and immediately marketable. The light oil, obtained in a water condenser, is immediately marketable for use in ore refining, and the yield is twelve gallons to the cord of wood. Eighty pounds of acetate of lime are obtained from the pyroligneous acid of each cord of wood. Nine hundred pounds of charcoal are the final yield.

Dr. Davidson has been working on the problem of simplifying the distilling of wood and coal by the process indicated above for over two years. The greater part of the work has been done in the Vancouver gas plant and the Tacoma gas works, and the facts discovered in these two plants were utilized last summer in a series of experimental runs lasting for about a month in the wood distillation plant belonging to the United States Forest Service and the University of Washington at Seattle. Mr. Davis, a senior student of that university, made the analysis of the products. Arrangements are now being made to test out the process in connection with the carbonizing of coal under conditions which give the volatile products as tar and light oils with a minimum of coal gas. It is expected that this will complete the experimental and demonstration work which is considered desirable.

## "SENSIBLE FIRE PRECAUTIONS"

(*Manitoba Free Press Editorial, Feb. 22nd*, 1917.)

The terrible disaster last year in Northern Ontario, involving the loss of 264 lives and the destruction of 800,000 acres of forest by fire,

served to draw public attention to the general question of protection against forest fires. Life and property in the northern areas of this Province will be rendered less liable to danger from this cause if amendments to the Fire Prevention Act now before the Legislature become law.

It is proposed to render it obligatory upon every person setting a fire in the wooded districts of Manitoba, or within six miles of a forest reserve, to possess a permit for the act. These will be obtainable either from a special fire guardian to be appointed or from a Dominion forest ranger, who will have power to refuse it in a dangerous season. Fire guardians are also to be invested with authority to arrest without warrant any person violating the Act, the burden of proof being on the defendant.

The institution of the permit system is aimed principally at settler's fires. After land-clearing operations it has been a common practice to set fire to the brush, often with disastrous results to vast areas of timbered land, not unaccompanied by risk to human life. Apart even from the needless destruction of valuable natural resources, *the precautions asked by the Fire Commissioner will be generally commended. No hardship is inflicted upon the settler by placing him under the necessity to observe reasonable care in setting his fires.* He is, in fact, relieved from the possibility of unpleasant suspicion by increased supervision in this respect.

**Paper For Warmth**

Paper blankets, long a familiar stand-by of the hobo, have been reduced to a form acceptable to the sportsman. The gentlemen of leisure who first made practical use of the insulating qualities of paper to secure protection from the cold simply covered themselves with old newspapers. Such "blankets" were too inconvenient and too fragile to ap-


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peal to the truly strenuous. But now the market affords a "blanket" of tough rice paper, covered with muslin for its protection, which will stand an indefinite amount of rough handling. Used outside of woolen blankets, it is reported, a pair of paper blankets will give as much warmth as an extra pair of five-pound wool blankets, with not much than one tenth their weight in the pack. This would seem to be a step toward the realization of the woodsman's dream of "a blanket as warm on the bed at night as it was in the pack all day."

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Now, I have struck a phase which you people understand—the forests. People living in Canada thousands of years from now will want wood and the products of wood just as badly as you do now. These resources are Canada's, and not yours, and during the period of trusteeship and occupancy the lesson is this—that no tree should be taken out of our forests where it was not provided that another tree was growing to take its place (hear; hear; and applause). Not one ton of pulp wood would be taken off the land of this country unless there was another ton coming to maturity to take its place in due time. It can all be done. Germany nearly every continental country in Europe has proved that. It can all be done and no intelligent man in the industry today can dispute that it can be done if forestry and forestry work is prosecuted under proper conditions and by proper conservation and preservation, using the things which are necessary for the present generation, but leaving it just as it was before."
—Sir George E. Foster at luncheon of Canadian Pulp and Paper Association Montreal.

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**CANADIAN FORESTRY JOURNAL,**
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# Wooden Homes for Belgian Refugees

A proposal that combines relief measures at present with export trade possibilities for the future has been placed before the lumbermen of the Pacific Coast by Albert G. Von Hecke, professor of civil engineering at the University of Louvain, Belgium.

Belgian refugees to the number of 1,000,000 have migrated to Holland. The housing of this influx of settlers required considerable attention on the part of the people of Belgium. The construction of two, three and four room portable houses was undertaken. The material for these houses came from the Baltic. The price of this material prior to the war was $16 per thousand delivered in Holland, on a $2.50 per 1000 normal freight rate from the Baltic. This price has advanced considerably, due to the abnormally high charter rates.

Mr. Von Hecke is touring in the interest of the Belgian Relief Fund, and has suggested that the lumbermen of the Pacific Coast, including fir, pine and redwood manufacturers, contribute a cargo of lumber, say three million feet, of such material as would be suitable for building these temporary structures in Holland, which later, upon the restoration of Belgium, may be moved over the border into that country.

### *Excellent Advertisement*

Mr. Von Hecke states that he believes an admirable opportunity now exists to advertise the merits of Pacific Coast woods in Holland, Belgium and France. The class of material required for these houses would be common grades, but Mr. Von Hecke believes that some of the higher grades of Douglas fir, pine and redwood should be included in the sample cargo with a view of demonstrating the qualities of both lower and upper grades of Pacific Coast lumber. He has suggested that this lumber be stenciled so as to identify its species and the source. The stenciling to be effective should be in Flemish, French and English.

### *Modern Houses Rare*

In an interview Mr. Von Hecke stated that the people of Europe, with the exception of Norway and Switzerland, were not accustomed to the wooden house, the ordinary building material being brick and stone. It was a revelation to him to learn that wooden houses 100 years old are in good condition in some sections of to-day. This fact should be impressed very strongly upon the people of Europe, who look upon wood merely as a temporary building material.

### *Cost of Rebuilding*

The New York Economic World has printed a most valuable compilation showing the approximate losses sustained by France and Belgium on account of the war. The figures are stupendous. The presentment is a most interesting one and will be studied with deep interest and appreciation by the lumber interests.

"In a report on 'World Trade Conditions After the European War,' submitted to the Fourth National Foreign Trade Convention, at Pittsburgh, Pa., January 25-27, 1917, estimates were included of the value of the property destroyed as a result of the war in Belgium and Northern France, and of the cost of what will be immediately required for replacement purposes upon the conclusion of peace. The sections of the report covering these matters are as follows:

"Several attempts have been made to estimate the financial loss caused by the war in Belgium and Northeastern France. These estimates were mostly made in the early part of the war.

"During February, 1915, the Cen-

tral Committee of the Agricultural Restoration of Belgium and Northeastern France in London estimated the total loss of agriculture in Belgium at $280,000,000, of which $150,000,000 was lost in crops and stock. The loss of France was estimated to be approximately the same.

## TWO GOOD TURNS ASKED OF MEMBERS

*First*: Request your Public Library to become a member of the Canadian Forestry Association thereby placing on the library reading tables everything we issue.

*Second*: Clip out the following sentence and ask the manager of your favorite motion picture theatre to run it in on future programmes. He will likely do it gladly.

When you are in or near the forest this summer, never leave your camp fire until it is absolutely OUT. Never throw away lighted matches or tobacco or pipe ashes. These rules are followed by all veteran sportsmen and good citizens.

(*From Pulp & Paper Magazine*)

The salary of E. J. Zavitz, director of forestry for the province of Ontario, has been increased by the Provincial Government from twenty-six hundred to three thousand five hundred annually.


## Homesteads or Farm Lands

Oregon & California Railroad Co. Grant Lands, title to same revested in United States by act of Congress dated June 9, 1916. Two million, three hundred thousand acres to be opened for homesteads and sale. Timber and agricultural lands, containing some of best lands left in United States. Now is the Opportune time Large sectional map showing lands and description of soil, climate, rainfall, elevations, etc., postpaid one dollar.

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A Partial List of Contents of the March 1917, Issue of

# Rod and Gun in Canada

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The Treacherous Snow; King of the Big Swamp
A Brother Sportsman
Gun Trap Set for Wolf
The Winter Camp
Matters Pertaining to Conservation
The Survival of The Fittest.

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## NOTICES TO LOCATE RANGERS

*By B. M. W.*

Great strides are being made in the advancement of forest protection methods and standards. The move by the Ontario Government in the appointment of an expert to handle a reorganized protection service, the enactment of laws relative to settlers' fires and the burning of slash, the enforcement of regulations now on the statute books, and the success of the cooperative associations on the Lower Ottawa and the St. Maurice watersheds indicate the growth of appreciation of forest protection.

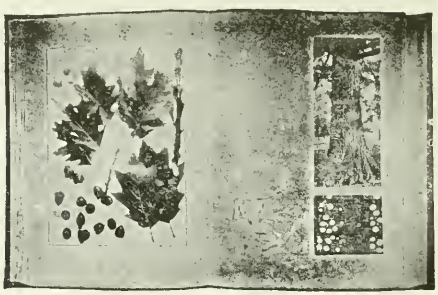
It is patent that if small fires were attacked when they were small there would be no big fires.

Rarely, if ever, is an organized attempt made to fight fire until the government ranger arrives. This may occur in 24 hours, possibly within a week. In the meantime the fire gets good headway and the expense necessary to extinguish it rolls up. The sooner the ranger is notified the sooner will he arrive.

Forest guards are not permanent, changes in the personnel of the staff are made from year to year. Usually it is very difficult to ascertain who the ranger is and where his headquarters are. The most needed improvement of the present is the placing of notices before the public showing name and location of ranger with a request to phone him in case of fire. The following notice printed in French and English and posted in Railway Stations, meeting halls, Post Offices and near churches and summer camps will justify the expense. No other printing should be on these notices.

### New Forest Fire Laws

G. M. Homans, State Forester of California, is preparing a forest fire law which he will present to the incoming legislators. Strange as it may appear, California has practically no forest fire regulation in common with those of Oregon, Washington and Idaho.

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### TREES FOR C.P.R. STATIONS

An extension of the Floral Department of the Canadian Pacific Railway for 1917 includes the planting of trees and shrubs about the stations as well as a great variety of perennial plants. From this time on the gardens are to take permanent form. The Floral Committee is composed of Messrs. F. Curtis, Montreal, B.M. Winegar, Forester, Montreal, and R. D. Prettie, Superintendent of Forestry, Calgary. The company has had great success in its scheme of beautifying the grounds about station buildings, prizes being awarded for the best work. Not only has the added attractiveness been appreciated by the travelling public but the resident employees and their families have been benefitted. The development of the plan so as to include trees and shrubs is praiseworthy and ought to bring good results within a year or two under the new committee.


# New and Interesting Publications

## Sent Free of Charge to Any Member of the Association

**"MON PREMIER LIVRE SUR LA FORET"**

32 pages, 25 photographic illustrations. An attractive booklet for French-speaking senior boys and girls. This edition will be distributed in many of the schools of Quebec, in parts of Ontario, New Brunswick and Manitoba. (Printed in French only).

**"THE WHITE PINE OF CANADA THREATENED WITH EXTERMINATION"**

An eight-page pamphlet, well illustrated, by H. T. Gussow, Dominion Botanist giving the most thorough discussion of White Pine Blister disease yet published.

**"YOUR ENEMY'S PHOTOGRAPH"**

A six-page folder with graphic fire picture in four colors. Published in French and English. Text deals with fire prevention.

**"WHO LOSES?"**

A four page pamphlet, illustrated, containing Question and Answer on a score of points commonly raised regarding the forest resources of Manitoba, Saskatchewan and Alberta.

**"FIRE!"**

A racy eight-page pamphlet, with cover picture of an approaching conflagration in red and blue. Contents include a sketchy talk on forest protection, and complete directions on "How To Build A Camp Fire." This booklet of special interest to guides, campers, sportsmen, etc.

The Forestry Association is carefully distributing large editions of all of the above throughout Canada, through the channels of branch banks, railroads, forest services, the clergy, etc.

If you believe you can assist this distribution, the Secretary will be glad to hear from you.

Lumber, pulp, paper and other wood-using industries can secure whatever quantity desired for local distribution at the bare cost of printing.

**By a recent ruling of the Association, our many 1917 special publications can be sent only to members who have paid their fees for the current year.**

## CANADIAN FORESTRY ASSOCIATION

119 BOOTH BUILDING, OTTAWA.

## "Rapid Deterioration"; a Timely Warning

One of the important subjects engaging the attention of the Advisory Council for Scientific and Industrial Research, recently appointed by the Dominion Government is the preservation of the forests of Eastern Canada. "These, contrary to the opinion which prevails generally, are not inexhaustible," says an official announcement of the Council:

"They have already been seriously depleted and are rapidly deteriorating in character. In most of the leading countries of Europe the forests, whether owned by the Government or by private interests, have, by the application of modern scientific knowledge, been immensely improved in character, and instead of being plundered and then abandoned, have been converted into assets of enormous national value, and which year by year yield large revenues to the Government, or to their private owners, which are as regular and as continuous as those from any other gilt-edged investment, the forest all the time being maintained with its capital unimpaired.

"Different methods of forest management have been adopted in different parts of Europe to secure this splendid result. The Canadian forests present special problems of their own. The Council has recommended that certain investigations be at once carried out through the Forestry Branch of the Department of the Interior, to ascertain which of these methods can best be applied to the Canadian forests for the purpose of stopping the destruction which now threatens them, and making them a great and permanent source of wealth to the people of the Dominion.

"As has been mentioned, other important problems are now under consideration by the Council, but require further examination before the Council is in a position to take action with reference to them.

"This excellent work which will all help in giving to Canada the place which she should occupy in the industrial world, should receive the hearty support of the whole public of the Dominion."

---

## Great Forest Development for Russia

The development of the timber business in Siberia and Eastern Russia is engaging the attention of the Russian people. In a recent article in The Economic World, of New York, Samuel McRoberts, vice-president of The National City Bank of New York, in referring to Russia timber supply, said:

"Russia's forests have hardly been touched, and comprise to-day the great timber reserve of Europe, the empire having practically all of the surplus timber available outside of Canada and the United States. She exported in 1913 some $84,000,000 worth of timber products.

"Europe must go to Russia for timber when the inevitable rebuilding program begins, and will afford Russia a wonderful opportunity to realize upon the latent wealth of her forests. This will require an enormous outlay of capital for the building of railroads, port facilities, steamships, sawmills, pulp mills, and all those things incidental to the manufacture and transportation of timber products. The development of Russia's railroads since the beginning of the war has been at a standstill; and even now they are inadequate in her most developed territory. The opening up of Turkestan and Siberia

# STAG

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will require an enormous program of railroad building. If we include the undeveloped territory of Russia, an idea of what railway mileage may be required can be obtained by comparison with that of the United States. The total mileage in Russia is at present 47,000 miles, against 260,000 miles in this country. This means for Russia, on the basis of square miles, only 5 per cent, and on the basis of population, only 10 per cent of the railway mileage of the United States."

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**Canadian Forestry Association,**
**Booth Bldg., Ottawa.**

## GAME REFUGES

*By E. R. Kerr*

When the sportsmen of Ontario are sufficiently organized and are considering the question of game reproduction through the establishment of game refuges, or game sanctuaries, upon a number of the National Forests, they must clearly realize that others also are interested in the use of these forest areas, and they desire to proceed along lines which will be at once just and equitable to all concerned.

It is well known that many of the areas once occupied by various game animals and birds are now more or less used by the flocks and herds of settlers. At the same time, there are many forest areas which cannot be used to advantage for domestic stocks, or which from their very nature will support a number of wild game in addition to domestic stock without injury to either.

It will be the policy in establishing such refuges, or sanctuaries, to locate

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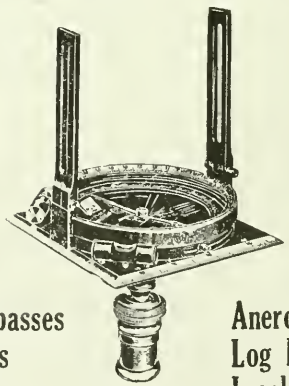

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them, as far as possible, upon areas which are so rough or inaccessible as to prevent their use by domestic stocks, and before one is established, this side of the question must be carefully looked into. These areas, however, will be comparatively few, and the restrictions upon grazing which may be necessary will not be a burden on the nearby farmers or settlers.

Many sportsmen to-day feel certain that every farmer, stockman and settler is interested in the preservation of game birds and animals in his vicinity, and the only practical method of preservation seems to be through the establishment of sanctuaries in which they may breed and multiply and eventually spread out over the surrounding country. There they may be hunted during the open season and in accordance with the laws of the various provinces in which they are located, thus furnishing to the local settlers a fairly stable supply of winter meat. It is, of course, unreasonable to expect that such game as deer, moose and caribou can subsist upon barren rocks and mountain scenery. They must have forage upon which to exist, the same as all other animals of their class. At the same time it is well understood that such animals as these can and do sub-


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GEO. Y. CHOWN,
Registrar.

sist upon many species of plants and grasses which are not palatable to domestic animals, and also that they will penetrate into regions so rough and so distant from water that domestic stock will not use them.

## ENGINEERS COMMEND CONSERVATION

In the report of the Conservation Committee of the Canadian Society of Civil Engineers, presented at the annual meeting held in Montreal on January 23rd to 25th, reference was made to the conclusion of a treaty whereby Canada and the United States will cooperate in the protection of migratory bird life which would prove of inestimable service to agriculture and forest production, the two chief branches of Canadian primary industry. The material importance of this measure and the utility of the insectivorous bird life which it is designed to protect might be judged from the statement based on reliable authority that the annual loss in the United States from the depredations of insects amounts to $800,000,000.


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# No Politics in B. C. Forest Service!

The lumbermen of British Columbia took an important step recently when they appointed a deputation of their members to wait upon Premier Brewster at Victoria and urge that the Forest Service of the province be so administered in future that politics shall play no part in it.

The deputation was composed of Mr. C. D. McNab, president of the Mountain Lumbermen's Association; Messrs. H. R. MacMillan, Hugh Davidson and R. H. H. Alexander, of the Coast Lumber & Shingle Association; and Messrs. Mark Rector and W. B. W. Armstrong of the B. C. Loggers' Association. In order that the Forest Service might be taken entirely out of politics these gentlemen suggested to the Premier that all appointments be placed in the hands of a Commission composed of five members—two representatives of the Mountain lumber interests, two named by the Coast lumbermen, and the Minister of Lands. Premier Brewster said that when taking office his government had determined to make efficiency their guiding principle when making appointments, and believed the objects aimed at by the lumbermen would be fully safeguarded in this way, but he was prepared to promise very careful consideration of the commission plan on the part of himself and colleagues, their earnest aim being to handle the forest resources of the province in a way that would yield the highest possible revenue while conserving the supply of timber and guarding the future growth.

The Victoria Colonist, in referring to the request made by the lumbermen, backs up the need of technically trained men for the Forest Service in the following words:

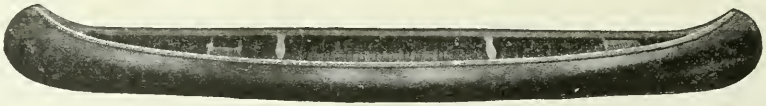
"Ever since the former Chief Forester, Mr. H. R. MacMillan, inaugurated the Forest Branch of the Department of Lands, it has been the aim to have a professional service, that is, a service composed of men who have undergone training in the technical side of the business. This practice is now being followed everywhere that governments have control of forest wealth. British Columbia took the lead in Canada in that respect and only recently Ontario, profiting by the drastic experience it has had in the tremendous waste of timber wealth in northern Ontario through disastrous forest fires, has adopted the most of British Colubmia's forest protection methods. The fact, too, that the provincial branch has been co-operating in many material ways with the federal authorities in forest protection and that this joint work has done great good in reducing the timber loss from fires to a minimum is indicative of the necessity that in the future the efficiency of the service should be maintained at the very highest point. The present Chief Forester, Mr. M. A. Grainger, is also a strong advocate of a technically trained service, and while, since the war began, the service has lost through enlistments some of its best field men, it is his desire to keep the service up to the previous standard."

---

**Douglas Fir on British Railways.**

As evidence of the remarkable strength of Douglas fir, an official of one of the great British railways in a letter to an official of the British Columbia forestry department, stated that out of 616 railway ties of Douglas fir laid down more than 16 years ago, on a main line over which traffic of fifteen million tons per annum passed, only 23 had been renewed, the remainder being still in good condition.

British Columbia possesses an inexhaustible supply of this magnificent timber observes the Vancouver Sun, and undoubtedly it will compete successfully with other timber in the markets for building timber which will be opened in Europe when the war ends. Present indications are that Douglas fir will be a source of immense wealth to this province at the close of the war.



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119 BOOTH BUILDING, OTTAWA

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Entered at the Post Office at Woodstock, Ont., as second-class matter.

# The Great Forests of Russia

## Republican Government will Administer the World's Greatest Timber Supply—Siberia can Supply Whole of Europe.

The political overthrow of the "dark forces" in Russia and the promise of a more vigorous development of the national resources under republican rule, draws attention to the advantageous position of the Russian Empire in supplying the future timber needs of Europe.

Russia possesses the world's greatest supply of forest wealth. The value and quality of fully two-thirds of it, however, are but meagrely known. The total area of the Empire is about one seventh of the land surface of the globe and 39 per cent. of it is under forests. Those in European Russia cover an area of 474,000,000 acres; in Finland, 50,500,000 acres; in Poland, 6,700,000 acres; and in the Caucasus, 18,600,000 acres; a total of 549,800,000 acres, exclusive of Siberia. It is estimated that in western Siberia alone there are 465,000,000 acres of virgin forest, and that Eastern Siberia, while not so richly endowed, has sufficient timber to supply the world's demand for years to come.

Approximately twenty-three per cent of the forest land belongs to the aristocracy and 9 per cent to the peasantry.

The Russian Government owns the bulk of the forest assets and has received about $30,000,000 a year, four-fifths of which was net profit.

As in nearly every other country where 'old fashioned' lumbering has its way, Central Russia now sees the timber wealth pretty well stripped, so that lumbermen are turning their attention to northern Russia where more primitive timber conditions prevail.

While Russia founded her Department of Forestry and the Imperial Forest Institute at Petrograd 110 years ago, no comprehensive scheme of national forest management has yet been applied. Facilities for the training of foresters have been provided at the capital where 54 professors and instructors are employed, with 648 students, and an annual government appropriation of about $120,000. The Forest Institute contains 23 buildings, 13 laboratories and museums and a splendidly equipped dendrological garden in addition to several hundred acres of ground surrounding the buildings.

There has been in possession of the Government at Petrograd for some years a plan for the cutting of timber on a large scale worked out by the Russian Committee for Colonization, but like other reforms in the management of the public estate this had been shelved for 'further consideration'.

Foreign capitalists have taken up immense tracts of timber in Siberia. "With correct exploitation", writes a French investigator, the timber of Siberia will suffice for the requirements of western Europe for generations to come." The Forestry Department places the Siberian timber lands at 810,000,000 acres, and with the present population this is 43 acres per capita, which the Russian foresters believe can safely be reduced to three acres per capita.

What this immense resource really means is shown in the estimate of the Forestry Department that Siberia can spare 115,200,000 trees per annum, under proper reforestation methods without diminishing the capital stock of timber. One hundred

BALKAN LUMBERING METHODS

**Serbian lumberjacks drawing out logs. Modern methods of woods operating have made little impression on the Balkan countries, but the reorganization following the war is expected to introduce economical systems of utilization.**

years is accepted in this calculation for the maturing of a tree.

As to the Government's method of collecting dues, the Amur province of Siberia affords an illustration. Here the management is in the hands of a local Government office of the Department of Domain. The tax is collected on the cubic contents of the logs sold, ranging from one-half to 7 cents per cubic foot, according to the importance of the forest, size, kind, and form of timber, distance from the market and means of transportation.

British writers have frequently pointed out, as mentioned in a recent article in the Canadian Forestry Journal, that with Great Britain and Belgium and to some extent, France, seeking timber in enormous quantities after the war, there is a danger of the Allies bidding against one another and so running the prices to extreme levels. It has been suggested that Russia be called into council on this point so that her great forest resources shall be placed at the disposal of the Allies under favorable terms. Germany and Austria have large amounts of timber, owing to their highly-developed systems of scientific forestry, and with such wood-exporting neutrals as Sweden, might have the timber markets of Europe at their mercy. British writers as a rule do not look to Canada to solve this riddle, owing to the great cost of ocean freightage, and owing quite as much to the destruction of the most easily-logged timber in Eastern Canada which, had the method of exploitation been radically different, might today have supplied the United Kingdom to the great benefit of buyer and seller.

R.B.

# Conditions In The Lumber Industry

*Excerpts from the U.S. Government Report by William B. Greeley of the U.S. Forest Service*

The industry seems to have been built up beyond the needs of its market, for at least a third of its saws are idle. It is carrying an installed mill capacity of approximately 117 billion feet as against an estimated cut in 1914 of 40.5 billion.

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The interest and taxes paid out on timberlands held over long periods may mortgage liberal advances in future worth.

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Market values of stumpage have stood still for eight or nine years and even declined. Western timberlands have been overcapitalized more or less and can hardly earn in the long run the profits expected of them. The large speculative gains in buying stumpage which have tided lumbermen over many tight places are mostly over.

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The industry is approaching the point where its early stumpage costs will equal the market or operating value of the timber. It becomes doubtful whether the interest rates upon which much of its capital has been borrowed and its financial structure built up can, as economic conditions are now crystallizing, be returned by forest lands during long periods. Future returns must be realized from efficient lumber manufacturing and merchandising.

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Unsuited by nature to this form of wealth, it (the general property tax) tends toward heavier taxes than a sound forest industry can bear. Uncertainty as to the future extent of this burden is a menace to the stability of timber ownership. Moderate, and particularly stable, taxes will aid powerfully in securing the right kind of forest ownership.

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There are two ways of carrying the surplus timber. A more stable type of private ownership may grow out of present conditions. A second solution is the enlargement of the public forest holdings. Stable forest ownership might be secured also by administering public and private lands as a single holding, publicly controlled as to rate and methods of cutting.

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Broadly viewed, the returns in lumber distribution appear to average higher and be more stable than those in lumber manufacture.

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A fifth or more of the cost of lumber to consumers is eaten up in railroad freights, retailers take about the same amount, and manufacturers, on the average, little more than one-half.

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The rise in lumber prices, though very marked during the 10 years before 1908, has not been greatly different from that of most commodities; since 1907 lumber has fallen behind.

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Lumbermen have frequently overcut their markets. Less than living prices and waste of raw material are the evidence.

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With local exceptions, lumber production is competitive. Added difficulties in the way of a general lumber trust are the competition of substitute

materials, the limited inroads of foreign timber, and the check furnished by public forests.

Too great a burden of timberland investments is thus the first cause of instability in the lumber business. Excessive mill capacity, poor financing, and low average efficiency in manufacture and merchandising add to its weakness. The combined result is an ill-adjustment of lumber production to the requirements of its market. Competition in manufacture is not only keen but often destructive.

In the Northwest the "heavy load" of stumpage is at the bottom of the situation. Mills have been constructed solely because timber owners can no longer pay taxes and interest on their stumpage without income. In other words, for one of the underlying causes of weakness we must go back to the public land policy of the United States.

Lumbering is perhaps the most "American" of our manufacturing industries. In its individualism, its encouragement of small independent business units, its hearty competitoin, and the rugged, forceful qualities it has derived—it expresses many National economic and social ideals. Its failings are those which go with this type of enterprise.

One of the fundamental causes of the periodic overproduction of lumber is lack of common understanding of the situation and of a general conception of the effective way to meet it.

# *No Standard Practice For Slash*

Mr. R. D. Prettie, Superintendent of Forestry for the Canadian Pacific Railway, Calgary, Alberta, speaking of the problems of slash disposal in a recent paper, said that the questions that would come to the mind of any one reading a description of a slash disposal operation would be as follows:—

1. Are our conditions the same as the writer's?
2. Where is he logging?
3. What is the extent of the operation?
4. What is the nature of the country?
5. Is that country subject to great fire risk?
6. What about the rain fall?
7. What are species of trees?
8. Is the amount of slash excessive?
9. Is there need of burning after logging?
10. What burning has been done to date?
11. What is the cost and against what account is it charged?
12. How does burning compare with contract lopping?
13. Is broadcast burning recommended?
14. Is a universal law practicable?

The C.P.R. logging operations are on the Bull River in British Columbia, the country is rough and the logging is expensive. The fire risk in the Crows' Nest and Boundary country is probably as high as anywhere on the continent. The rain fall is very light, most of the precipitation being in the form of snow. There are periods of hot, dry winds that blow continuously for days at a time.

Fir, spruce, jack-pine, tamarack and bull-pine occur in about the order given.

The amount of slash is not excessive, except in spruce bottoms and along draws on some benches, yet there is enough slash to cause grave concern in case of a fire. The only burning done to date is along tote roads, around the camp and in one bad pocket at the forks of a stream. It was at this spot that a fire was recently stopped.

Specific cost data cannot be given, but will be from $4 to $8 per acre, depending on topography, relation of roads to waterways and stand per acre. If this is charged against logging it may make the cost of this operation excessive, especially where the stand is poor and logging difficult.

Some lopping of tops has been done and on some contracts, props were taken from the tops. This was not done for profit, but to eliminate waste.

Broadcast burning is feasible and desirable on land suited to agriculture, otherwise it usually is not to be recommended. This method can be employed in small pockets scattered over an operation and if these pockets are selected according to the fire risk and the second growth, a great menace will be removed.

A universal law requiring the disposal of all slash is not practicable now.

# What Wild Life Means To Canada

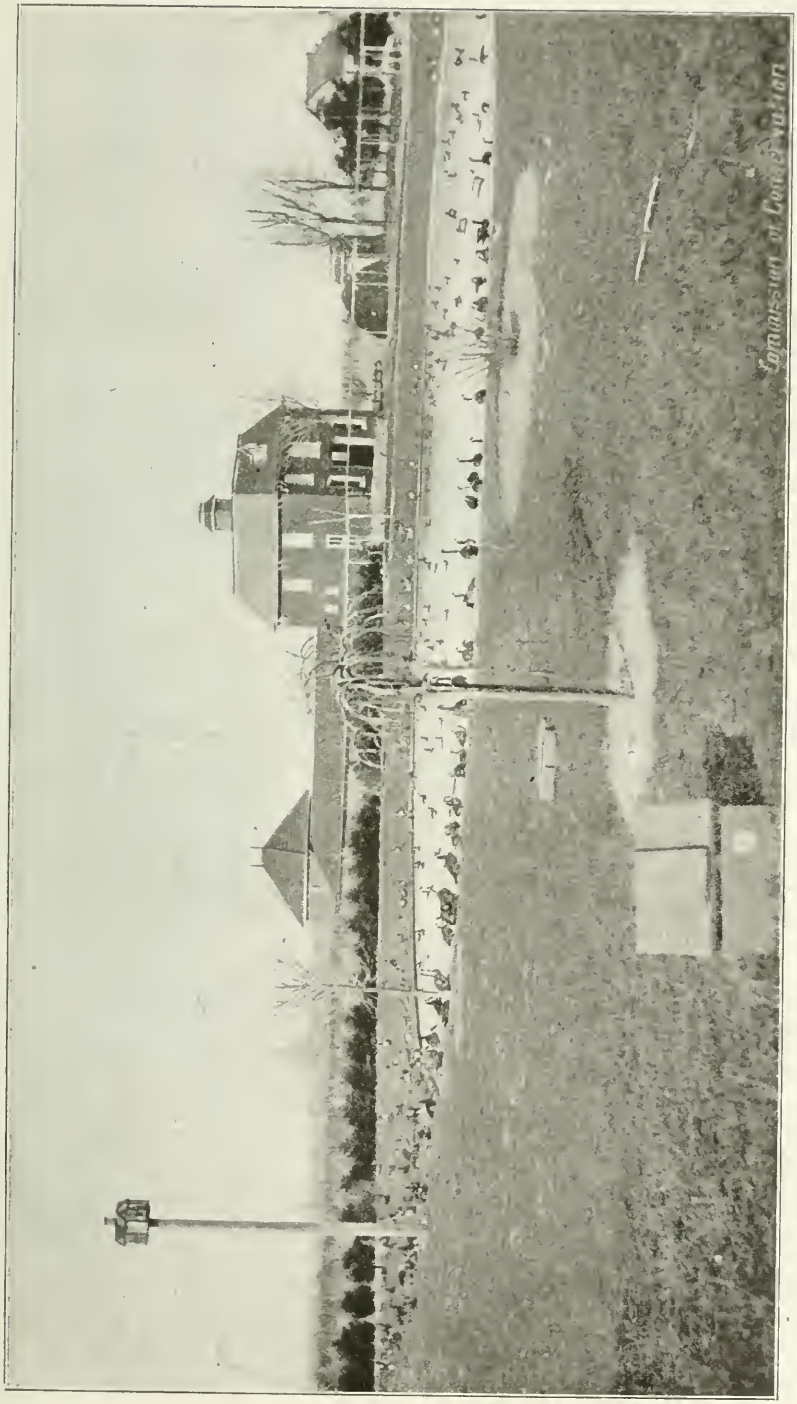
## A Splendid National Asset Threatened with Quick Depletion—Forest Destruction a Main Contribution.

Dr. C. Gordon Hewitt, Dominion Entomologist and Secretary of the recently appointed Advisory Board on Wild Life Protection, delivered an illustrated address on the "Conservation of Wild Life in Canada," before the Ottawa Field Naturalists Club on March 6th. In the course of his lecture Dr. Hewitt clearly emphasized the important interdependence of the conservation of our forests and of our wild life. The destruction of our forests is one of the principle factors related to the diminution of the wild life resources of the country. Further, he pointed out how forest and non-agricultural areas might be made additionally productive by the conservation of such animals as deer which might be used to provide a native meat supply.

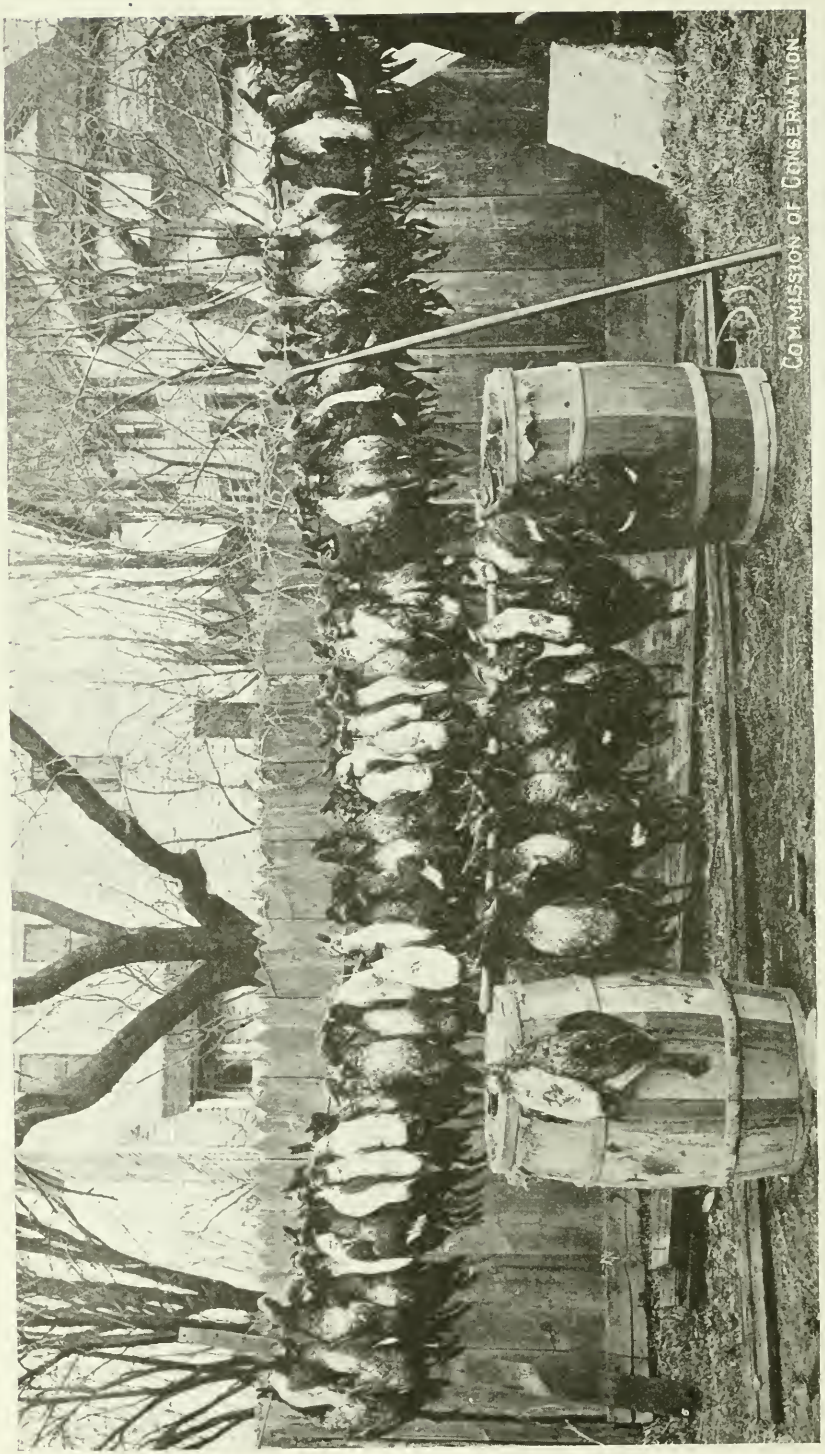
The wild life, including the fur-bearing and other mammals, and bird life, constitutes a national resource that cannot be replaced once it is lost. This point was strongly emphasized as a reason for taking steps to prevent the extinction of any species. Canada is the last stronghold of the larger game animals of North America and therefore a special responsibility lies on Canadians to conserve these animals. Wild life is a trust and it is the duty of Canadians to conserve it in such a way as to insure its unimpaired enjoyment by posterity. Conservation does not mean the hoarding up of, but the use of our resources without abuse.

### *Antelope and Buffalo*

It was further pointed out that there was an inevitable reduction in the existing numbers of wild life following the settlement of the country. Dr. Hewitt divided the causes of reduction into two groups, avoidable and unavoidable. The disappearance of the buffalo, of which he gave a historical description, was inevitable and due to the settlement of the country, and the same is true of the antelope. They have been driven from their familiar haunts by the development of agriculture in the west. Among the animals that have been



CONSERVATION OF WILD LIFE: WILD GEESE ATTRACTED TO THE UNIQUE BIRD SANCTUARY OF JOHN MINER, NEAR KINGSVILLE, ONT.




CONSERVATION OF WILD LIFE: DUCKS ILLEGALLY NETTED IN LAKE ONTARIO.

reduced in numbers by causes that were unavoidable the following species were mentioned, and their habits and status and the cause for reduction described; the elk, deer,caribou, musk-ox and sheep. The great reduction in our wild fowl due to the absence of adequate restrictions and the limiting of spring shooting were discussed.

### *Why Preserve Wild Life*

Cogent reasons were advanced as to why we should conserve our wild life. The value of these resources to the nation was dealt with under three heads, namely, recreative, economic and educative. The recreative value of wild life is important in as much as it increases human efficiency. It takes men from their offices to the forest at least once a year and thereby increases their resourcefulness and self-reliance. The value of wild life as an attraction to the sportsman should not be affected by any reasons of sentiment as the ethics of a good sportsman consist in recreation and not in securing the bag limit. Canada was favored above all countries in the world in having its big game areas so nearly accessible to its centres of population.

### *A Source of Food*

The economic value of our wild life should appeal to all, especially in view of the increased cost of living. Dr. Hewitt pointed out that in our wild life we have a potential food supply of very great value. The immense non-agricultural and forest areas could be made productive, he suggested, by the careful conservation of our deer which would constitute a native-food supply, and the state of Vermont was quoted as an example in this respect. He further stated that the barren ground caribou are not only essential to the natives in Northern Canada but that they constitute a resource of the greatest value from the point of view of a potential food supply and a source of skins for manufacturing purposes. On a smaller scale this has been demonstrated in the case of the domesticated reindeer of Alaska. In his opinion there is no reason why, at some future date, the caribou herds should not be so utilized as to provide an important part of our meat supply under Government control, or supervision, and provided the principles of wild life conservation are correctly and adequately applied.

### *Danger to Fur Bearers*

It was pointed out that the fur-bearing aniials of North America contributed a most important addition to the revenue of the Dominion. They constitute an important section of the national wealth and should be carefully protected from undue exploitation, of which there is great danger at present.

He referred to the example of Greenland in which the fur-trade is the monopoly of the Danish Government.

Big game hunting was not to be despised, for in some parts of Canada the inhabitants subsisted entirely in the money thus brought into the country; this is particularly true in certain sections of British Columbia, which is our greatest big game region.

Reference was made to the economic value of our insectivorous birds; a subject with which the lecturer has dealt with on previous occasions. The great importance of our insectivorous birds as destroyers of and a natural check on insects affecting agriculture cannot be too strongly emphasized and is becoming more and more realized.

### *In the Breeding Season*

In discussing the principles of wild life conservation, Dr. Hewitt pointed out that the great necessity was protection during the breeding season to all classes of game mammals and birds. The protection of the females and the young was necessary in the case of most animals and the wisdom of insuring such protection has been demonstrated by the manner in which the moose have increased in New Brunswick and Nova Scotia.

The most important step, however, that has yet been taken to insure conservation of wild life is the establishment of refuges or reserves.

In such refuges or reserves animals may live undisturbed and increase in sufficient numbers to form a constant supply for the unprotected areas outside the reserves. They constitute nuclei, as it were, for the supply of animals and the animals soon learn to know where they can secure sanctuary, and seek such refuges for that purpose. Dr. Hewitt called attention to the fact that sportsmen usually select, in the case of deer, the animals with the largest heads as these are usually the most virile, and that the continued destruction of the best males would result in a degeneration of the race. Such protection in reserves would provide a corrective to this tendency and would also provide an excess of males.

*Enforcement Often Weak*

Good laws have been made by the Provincial Governments and laws should be especially provided for the protection of the females. Proper open seasons, and a bag limit in the case of wild fowl are restrictions that are especially necessary. But, good game laws are useless unless properly enforced, and the great lack in Canada at the present time is the proper enforcement of the laws already on the statute books. The different Provinces have good game laws, but in many cases there is room for improvement.

*Guarding Migratory Birds*

The importance of the International Treaty for the protection of migratory birds in United States and Canada, which has been recently passed, was emphasized and the provisions of the Treaty outlined. The main points of this Treaty, which pertains to the protection of our migratory birds passing between the United States and Canada are first, the prohibition of the destruction, at any time of the year, of any insect destroying birds important to agriculture or forestry and secondly, the prohibition of spring shooting of wild fowl such as ducks, geese, etc., and the restricting of the open season to three and one-half months. It was stated that this was the most important single measure ever taken with a view to the protection of wild life. The excellent work of the Commission of Conservation in the direction of protecting wild life, particularly the endeavor that the Commission is making to have the bird rocks in the Gulf of St. Lawrence made into a bird sanctuary, and the recent appointment of an Advisory Board on Wild Life Protection by the Government are indications that the Dominion Government is alive to the necessity of taking steps to conserve our wild life and to secure a proper utilization and enjoyment by the people.

*How Each Can Help*

Finally, the lecturer dealt with the means by which the individual might help in the carrying out of the principles of wild life conservation. He laid particular emphasis on the necessity of education and co-operation of interested individuals who should form game protective associations with a view not only to educating the people, but also in order to assist legislatures in game protective legislation and to secure the proper enforcement. The main points to be remembered are that wild life cannot be replaced if it is once destroyed; it is a trust, and the enjoyment of every citizen, but unless we take steps to impress upon people the necessity of conservation it is a resource which will disappear; and lastly, that of our many resources, it is one that we cannot afford to lose.

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The white pine berth 1F, in the Mississaga Reserve was sold recently by the Ontario Government to Mr. Robert McKay, who was the highest tenderer, the price paid being $7.50 per thousand feet, in addition to the dues. It is understood that Mr. McKay was representing other parties in making this purchase.

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Newsprint manufacturers in Ontario are of the opinion that a statement recently made by Sir Adam Beck in an address before the Hydro-Electric Union of Municipalities means that a large newsprint mill is likely to be established in connection with the Hydro-Electric Power Commission of Ontario, some time in the near future.

# Lecture Campaign In Western Canada

## Mr. Black's Meetings in Western Cities and Investigations of Provincial Problems Gain Hearty Public Response.

This number of the Canadian Forestry Journal is issued in the absence of the editor, Mr. Robson Black, who as Secretary of the Canadian Forestry Association is on a lecture tour through Western Canada in the interests of forest conservation.

Mr. Black has delivered addresses before several of the Canadian Clubs, Boards of Trade, the larger church organizations, etc. and by the generous co-operation of Western editors in the use of interviews, reports, and editorial comment, the sentiment of the prairie provinces would seem to have been stirred along progressive lines.

One of the most successful meetings was the luncheon of the Board of Trade of Edmonton where not only was an excellent audience present but the members authorized the Council to appoint a special committee to deal with the problems of forest conservation in Alberta.

Of the address, the Edmonton Bulletin said:

A picture of the desolation in the forests of Canada wrought by fires, was sketched most strikingly and effectively before the Board of Trade luncheon today by Robson Black, of the Canadian Forestry Association. Above all it was made clear how national caution and foresight can curtail and eventually wipe out this huge devastation to the enrichment of the nation.

### *Board Will Co-operate*

A largely attended meeting of the board listened to the excellent address and, through the president, J. E. Brown, the assistance of the members was pledged to a campaign of first aid in the work of conservation. Not only was a committee of the board provided to deal with the question of forest fire prevention, but another committee will likewise be named by the president to report on the matter of municipal fire losses, a topic which was ably presented by Mr. White, of the Conservation Com., Ottawa, one week ago. Mr. Black said in part:

"In these times no subject is worth discussing that has not its main root in public service. No apologies need be made, therefore, for talking over with you the case of forest conservation as related to this province and the rest of the Dominion. Conservation of any sort is just 'good citizenship', but the question of perpetuating the forest resources past the day of our own immediate need makes particular demands upon an unselfish point of view.

"The title to more than ninety-seven per cent. of the forest lands of Canada rests in the name of the Canadian people. By that I mean the Governments of Canada while leasing a very large part of the timber to support industries and spread wealth, have kept control of the land on which the timber grows. The object of this has been to secure for the state its share of the increment and to enforce such conservation laws as the situation might demand. The State, therefore, is the steward of the forest lands, and their management and protection from fire constitute one of the biggest issues before the people of Canada.

### *The Poor Relation*

"Eliminate for the moment the front-row brethren of grain growing and stock raising in your family of activities and look over this Forest Giant. He has been the poor relation of all public issues. One would think that he constituted a liability on the land, that he did not answer to cultivation, like a cow or a cornstalk,

for it is safe to say that niney-five per cent. of the vast forest values of the three prairie provinces has been ruined and forfeited in the last hundred years. This continuous chain of forest fires has done no good service for prairie agriculture but has bound it to depleted areas of thousands of square miles that for the life of at least this generation must be carried as a general liability.

"The immigrant from the United States and overseas sends, as it were, an advance program of his expectations. He wants his wooden house, wooden barn, wooden fence posts, wooden fuel, wooden furniture and half wooden farm implements. Doubtless he does not want trees cluttering his homestead more than necessary, but he does want the product of trees laid down at his door without stint and at a fair price. If Alberta cannot complete the contract, if Alberta can supply only the land, you have left a chunk out of the newcomer's rainbow. He will seek elsewhere for a more likeable combination of conditions.

*Seventeen Million Acres*

"We have in this province nearly seventeen million acres in forest reserves, out of a total land area of 161 million acres. You may think that is enough to keep the wood pile going for all the people coming this way. But measuring forest possessions by acres is slovenly reckoning, much like going down town to pick a diamond with a foot rule. What lies upon those millions of acres is a meagre legacy of past fires. It is the wreckage of a hundred years of maltreatment. The timber today within the prairie provinces is by no means sufficient to meet the needs of the population and must be increased by modern forestry methods. The insufficiency of our timber to keep pace with the demand of the future is true of every province and part from this side of British Columbia to the other side of Newfoundland. Timberlands are on the toboggan. We have only one-quarter the timber owned by the United States and yet their day of approximate wood exhaustion cannot be far distant. All that we have left would supply the United States demand just twelve years.

*Fire Waste*

"A new flow of millions of wood-using settlers is the daily prayer of western people and yet our preparedness program gives them a quickly deteriorating forest where fire, so easily preventible, is striking down ten trees to the lumberman's one, and where in the north of these provinces are patches of wantonly ruined forest land, as big as Belgium, preparing for you relentlessly desert areas as hopeless as Sahara. Talk of the 'inexhaustible' forest resources of Canada! There never has been a more mischievous phrase, cooing us along like the soothsayers about the Russian Czar. For even while the spellbinding Colossus weaves his tale of content, he is interrupted by 10,000 forest fires, big and small, every year, illuminating his words in black and red.

*Provincial Control*

"Does not the panacea for the ills of the western forests lie in provincial control and administration? The conservationist does not argue the political rights and wrongs of this question. He is concerned only in promoting complete unanimity as to the wisdom of guarding and developing to the utmost the forest asset, itself. He is interested in supporting such excellent steps as the Manitoba and Saskatchewan governments took at their last sessions in passing, new Acts to enforce supervision of the dangerous settlers' clearing fires in heavily wooded districts. He is interested in anticipating the same advanced action on the part of the Government of Alberta in the near future. Only by provincial co-operation in eliminating fire hazards can any rebuilding of this resource be attempted.

*Does Ownership Pay?*

"Whatever the past has held, whatever the future promises in the transfer of the title to the forest resource, the loser by today's neglect and the winner by today's care is the citizen of Alberta. Take over the forests and what do you take? The Dominion

Government is spending $100,000 on the fire protection and development in Manitoba's forest reserves and they get in return a revenue of $6,000, a straight outlay for many years to come, an investment for future settlers, of $94,000 a year; $151,000 is spent on Saskatchewan and $75,000 comes back; Alberta's protection costs the Dominion Forestry Branch $215,000, and a similar fraction is returned as revenue. All the revenues from all sources connected with the Dominion Government's forest possessions do not come within $200,000 of the annual outlay for the present degree of fire protection and forestry practice. Quite possibly the provinces may secure the administration of their timbered areas, but let there be no misapprehension. These forests, while today giving immense service to your settlers, coal mines, irrigation projects, etc., are over great areas like sick and crippled children and must be carried as a liability and nursed back to productiveness. On 100,000 square miles across the top of the three provinces, surveyed by the Dominion Forestry Branch only 13 per cent. had timber of eight inches or over. Fifty-five per cent. had very good young growth which, with exclusion of fire, will re-establish something like the original values.

"For long years Germany toiled at building forests on land not as well adapted for forests as the rough lands in Alberta; for years the costs of cultivation ran into dollars per acre, whereas we are not spending three cents per acre. But the more you put into a forest, the more science the more money, the greater the dividends. Germany has been extracting from $1.85 to $5.32 per acre in annual crops of wood, while at the same time adding greatly to timber capital. France has been getting $2.00 net revenue from state-managed forests. Our prairie provinces have never exceeded more than a few cents per acre for the public treasury. Why the remarkable difference? Why should Sweden draw in $100,000,000 a year from wood crops while with as good forest land and a lower latitude we lamely imitate with one or two per cent.? These nations put the blanket on fire waste fifty to a hundred years ago. We are still dreaming of doing likewise. These nations hitched up science with timber perpetuation. We are still in the dream stage on that too.

### 75 *Per Cent. for Timber*

"Probably more than seventy-five per cent. of the tree covered areas of the prairie provinces will produce one crop and one alone, timber. That is your fortune, not your misfortune. In Ontario quite 60 per cent. of the whole provincial map is fit for forests alone. In Quebec out of 210 million acres, only eight millions are under farm crops. Good business management, which is conservation, demands that those non-agricultural areas be utilized to their last penny of productiveness.

"Gentlemen, this is a year of thrift. Every prosperous European state prizing trees as the great balance wheel of agriculture and industry looks across to the perpetual bonfire of Canada's north with amazement. We are the only member of the belligerent group who since war commenced have had enough surplus life and financial strength to give up in one year 270 precious lives and, nearly every twelve months about six million dollars worth of property.

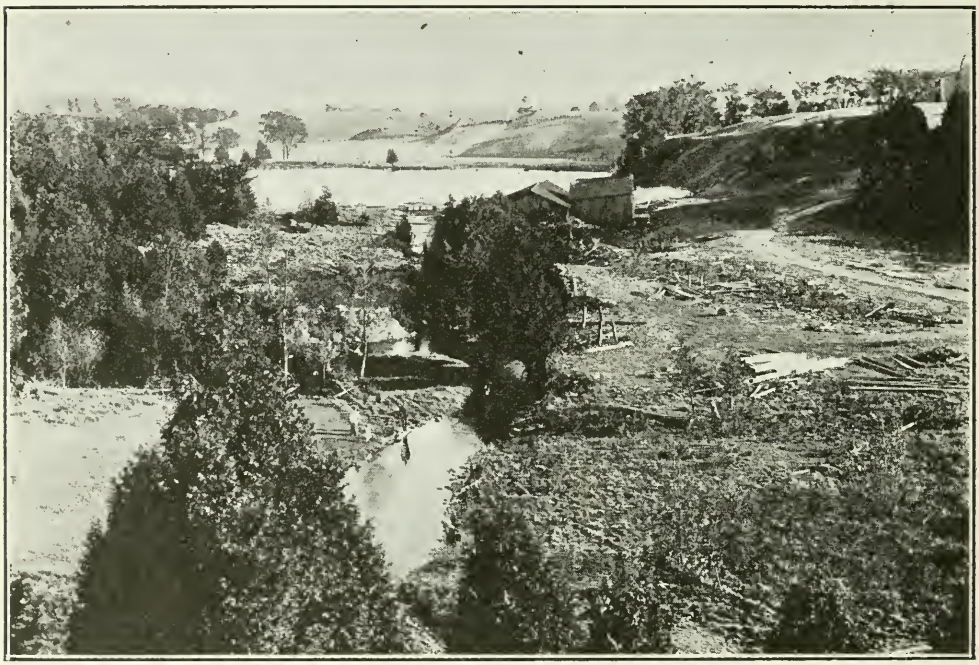
### *Take Personal Interest*

"This is first and foremost a government proposition, for we have the lease system almost entirely. Don't look to the lumberman for he is usually as far along in conservation as is public sentiment. Moreover, the lumber firm has usually a life expectancy of just so many years. But the state knows no quitting. It never gets bankrupt. It takes on the job for 1998 as for 1917. And because forest growing is a long time proposition and needs the providential hand of governments one may feel more satisfied that in these awakening days as to the duties of governments and the value of foresight, the people of Alberta will give to these imperative problems of the timber supply that personal concern without which public policies of conservation both here

and at Ottawa cannot be expected to make headway."

Mr. Black is also holding public meetings in British Columbia for two weeks and will address a joint luncheon of the Calgary Board of Trade and Canadian Club, another evening meeting and two high school lectures in Calgary.

## *Succeeding With A Tree Plantation*



SILOAM TROUT PRESERVE—VIEW OF THE BROOK AND TROUT PONDS.

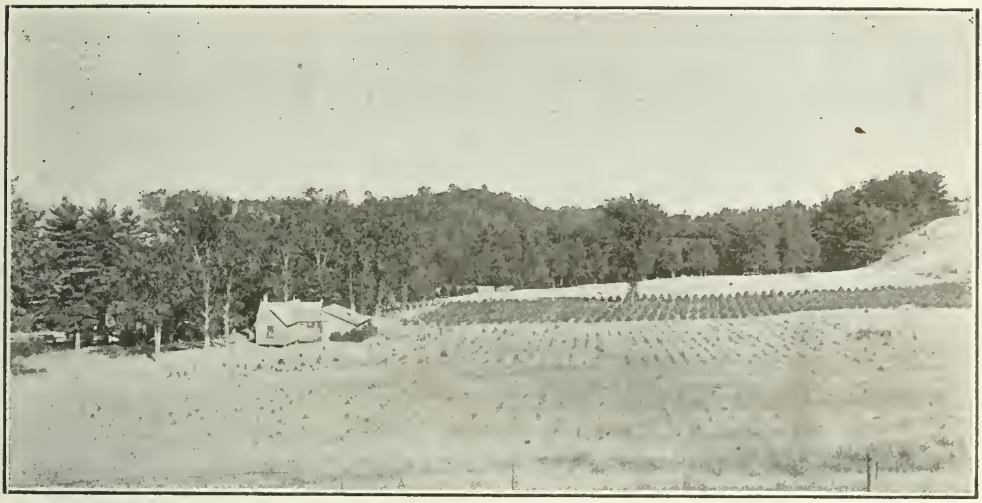
One of the most interesting spots in Ontario is near Uxbridge, Ontario, at the Siloam Trout Preserve and Plantation owned by Mr. T. B. Frankish, 33 Prince Arthur Ave., Toronto.

Mr. Frankish has a property of 75 acres of which 25 acres are under water, constituting one of the best speckled trout preserves in the Dominion. The township lot of which it forms a part was patented in 1790 and the following year a sawmill was erected which was run on the water power developed until 1914. In the Spring of 1912 Mr. Frankish began reforesting a portion of the land and there are now well on to fifteen thousand trees growing. They consist of Scotch, Red, White and Bull Pine besides Black Walnut, Butternut, Red and White Cedar, Red and White Oak, and White Ash.

The first year's planting consisted of 2500 Scotch pine out of which less than six failed. A better picture of vigorous growth could not be found; some of the trees have reached a height of ten feet.

Mr. Frankish spends most of his summer months at this delightful spot directing the work on the

plantation and in the capture of the speckled beauties. Brook trout have frequently been caught in this preserve weighing four-and-one-half pounds, the average being one to two and one half pounds. Mr. Frankish has been associated with this charming spot for the last 60 years.



SILOAM TROUT PRESERVE AND PLANTATION—VIEW OF SOME OF THE PLANTATION.

# *Common Sense on Xmas Trees*

In connection with the waste resulting from the annual cutting of small evergreens in the Christmas tree trade, as discussed in the January Forestry Journal, the sentimentally dressed but practical remarks of Bristow Adams are noteworthy. With reference to Canadian conditions it may be said that the loss caused in this way is but a small drop in the bucket compared with the annual preventable fire loss. Wasteful logging methods also account for a greater loss than that due to Christmas tree cutting.

In response to the Journal's call for further expression, the following might be suggested. It has been observed frequently that a large number of trees reaching the Christmas market both in Canada and the United States, are black spruce. Insofar as these trees were cut from bog lands the loss of future timber value is insignificant. Canada has many millions of acres of muskeg covered by black spruce that will never make anything else but Christmas trees. Such, in suitable form and size, are readily obtainable in unlimited numbers. Large areas of muskeg are now contiguous to railroads. Being frozen at the time of the Christmas tree harvest, they are easily accessible. Far from the necessity of suppressing this trade, it might thus be developed into a profitable industry.

The procedure is simple. Let forest officers direct the cutting of Christmas trees. In general, let this be confined to the muskeg. In some cases valuable young stands elsewhere might be thinned to advantage. In pulpwood operations, many tops of the smaller trees cut might be

made to serve. As has been pointed out, many trees growing out of place can be cut with profit instead of loss. All that is needed to minimize waste without sacrificing revenue is a little intelligent direction.

J. C. Blumer,
Commission of Conservation.

# Odd Uses Of Wood In War Time

## High Explosives, Gunstocks, Artificial Limbs, Paper Vests, Turpentine and Resin, a Few Products of the Tree.

*By A. W. Schorger*
*Chemist in Forest Products, Forest Products Laboratory, Madison, Wisconsin.*

One of the mysteries of the present war is the source from which Germany obtains the nitrocellulose necessary in the manufacture of smokeless powder and ordinarily made from cotton. A well-defined belief exists in England that at least part of the nitrocellulose needed by German powder factories is being made from wood; and if this is true it furnishes another instance of the surprising dependence upon wood, in one form or another, on the part of the fighting nations. The actual extent to which forest products are put to use in time of war, both for military purposes and for supplying the nation with some of the things it needs to carry on its daily life, is not generally recognized. Conditions, of course, have changed vastly since the day when Pepys offered up thanks in his diary for "the very good news of four New England ships come home safe to Falmouth with masts for the King; which is a blessing mighty unexpected, and without which we must have failed the next year. But God be praised for this much good fortune, and send us the continuance of His favor in other things.

Wood has ceased to be a large factor in ship building. Sea battles of to-day are fought by all-steel dreadnoughts; even the wooden backing of the armor plate is giving way to other materials. Wooden decks alone remain to link the old fighting ship with the new. But warfare on land has developed in a way to give timber an importance in field operations it never had before, while the vast number of accessories needed for the smooth running of the modern fighting machine, from ammunition to absorbent cotton, have led to an extraordinary demand for certain forest products, and have even brought about new uses for wood born of necessity and unheard of a few years ago.

*The Uses of Powder.*

For one thing, there is the matter of explosives. Ordinary black powders contain 75 parts saltpeter, 10 parts sulphur, and 15 parts charcoal. The charcoal employed must possess special properties, and is made largely from dogwood, willow and alder. In spite of the advent of smokeless powders, enormous quantities of black powder are still used. It is employed in shrapnel, for which only a moderately powerful explosive is required to drive the bullets. Besides, the smoke produced when the shell explodes is an actual advantage in enabling the gunners to determine the correct range. Black powder is also used to fill the rings of the time fuses with which shrapnel shells are equipped, for which purpose no satisfactory substitute has yet been found. Furthermore, it is used in most armor-

piercing shells, which should attain great penetration before they go off, and for which the majority of high explosives would be unsuitable because of their explosiveness on contact. Another product of the forests, resin, is employed for filling the spaces between bullets in shrapnel, so that on explosion the missiles will be evenly distributed in all directions. Its brittleness and at the same time, its hardness, together with its low melting point, fit it admirably for the purpose.

The period since the beginning of the war has witnessed a great amount of discussion in England as to whether Germany is actually employing wood from which to make the nitrocellulose for her smokeless explosives. When, after a long delay, England declared cotton contraband of war, it was maintained by many that this would not inconvenience Germany greatly, since she was already making explosives from wood cellulose. During the discussions that followed, it was proposed to destroy the forests of Germany by a giant fleet of aeroplanes armed with bombs; however, as one English editor naively remarks: "This would scarcely be feasible, since about one-third of Germany is forested."

### *The First Smokeless*

In this connection, it is an interesting fact that the first successful smokeless powder was made from wood about 1865. This powder, invented by Schultze, consists of a mixture of saltpeter and nitrated purified wood. While inferior to gun cotton in ballistic powder, it still retains high favor among sportsmen. Various other explosives, known as "white powder," "yellow shooting powder" and "Bautzen blasting powder," contain nitrated lignocellulose.

Aside from munitions wood is serving many useful purposes in the war. Millions of gunstocks are made from American walnut, which is the best wood yet found for the part. A new rifle, it has been estimated, is required monthly for every man at the front. In the modern infantry weapon the wooden stock is prolonged to the end of the barrel, which means just so much more wood needed in its manufacture. So great, in fact, has been the demand by gun makers for seasoned walnut that it has often been necessary to use birch and other woods as substitutes.

With characteristic foresight, the Germans brought portable sawmills with them into France, and have utilized their enemy's forests to supply their need for timber at the front, while reserving their own forests for home demand. The development of trench warfare, when vast armies of men dig themselves in on fronts hundreds of miles long, calls for an amount of timber for trench walls, floors, and braces that is difficult to estimate. Millions of feet of lumber are required also for temporary buildings behind the fighting line and for housing non-combatants made homeless by the fortunes of war. Still more goes into bridges, wharves, and the like. High explosives have made it possible for a retreating army to destroy stone and steel structures behind them in short order, and such structures the pursuing army must have the means of quickly replacing. Wood is, in most cases, the only material that will answer the purpose, and it served the German army in good stead during the pursuit of the Russian army through Poland.

Turning from the materials needed for actual fighting to the no less important ones required for proper care of the wounded, we find Germany, fully prepared for England's embargo, making a soft, absorbent surgical cotton from wood cellulose. Two factories in Sweden also are making this substitute. Slings are made from tough crepe paper, and splints from fiber boards.

### *Paper Shirts*

Wood is also contributing to the personal comfort of the men at the front. Russian soldiers are wearing paper shirts made in Japan, where such clothing has been in use for many years. The chief raw material for the manufacture of paper is, of course, wood pulp. Paper clothing is warm and cheap, and special waterproofing processes are overcoming its tendency to tear when wet. It may

be discarded when soiled, an advantage to the soldier from the standpoint of hygiene. The Germans and Austrians, mainly the poorer classes of the civilian population, use paper vests, socks, and handkerchiefs. Blankets and coats are padded with cellulose wadding. So many paper articles, in fact, are produced for the comfort of the people of Germany and Austria as to lead the Socialist organ, Vorwaerts, to declare, "To be without wood is almost as bad as being without bread."

To insure the presence of every factor that tends to eventual success, a country at war needs to maintain its economic conditions as nearly as possible at their normal level. Products of the forest play an important part in many peaceful industries which must be kept going in war time.

Methyl alcohol, the other product besides acetic acid obtained from the destructive distillation of hardwoods, has a multitude of uses. For one thing, it is essential in the manufacture of many medical preparations. For another, it is employed in the making of aniline dyes, the scarcity of which is being felt throughout the world. It is the source, also, of formaldehyde, one of the safest and most efficient antiseptics known, for the manufacture of which large quantities of wood alcohol are exported to Europe.

### *Making Turpentine*

The longleaf pine forests of the South furnish 90 per cent. of the world's supply of turpentine and resin. In normal times turpentine is used mainly as a solvent in the arts. It is entirely possible, however, should the need arise, to make from turpentine a synthetic camphor as good for practical purposes as the natural product. In the event of the blockade of the Pacific Coast, this should be the means of preserving our celluloid industry, which now consumes the greater part of the 5,000,000 pounds of Japanese camphor imported annually.

Resin, the use of which in shrapnel has already been mentioned, is employed mainly in the manufacture of cheap soaps and as a size for paper. So acute has become the scarcity of resin in Germany that the Prussian Minister of Agriculture has suggested such measures for increasing the supply within the empire as distilling resinous wood and collecting the oleoresin which exudes from trees peeled by deer. Prices being paid for resin by the Central Powers are almost fabulous. Curiously enough, a substitute for paper size, recently proposed by a German scientist, has wood tar as its base.

### *Casualties in Papers*

In connection with the use of resin for paper should be mentioned the fact that in time of war the demand on the forests for print papers deserves serious consideration. Of the 6,000 newspapers and periodicals in Germany and the 3,000 in Austria at the beginning of the war, it is estimated that some 1,100 of the German and 900 of the Austrian have since suspended publication either through inability to obtain paper or because of its prohibitive price. Germany has always imported large quantities of pulp wood from Sweden and Russia, so that cessation of importation of Russian pulp wood and American resin is a partial cause of the trouble. On the other hand, German war literature has been augmented by the 7,000 books and pamphlets since beginning of hostilities; and it is the invariable rule in all countries that the demand for newspapers and periodicals of all kinds increases enormously in a time of national crisis. The total daily circulation of French newspapers before the war, for example, amounted to approximately 7,000,000 copies. Their circulation has now increased to 15,000,000 daily, in spite of the suspension of a number of journals. The bulk of print papers is made from spruce and balsam fir. Experiments at the Madison Laboratory of the Forest Service have shown, however, that satisfactory newsprint paper can be made from some seven or eight other American woods, which places the United States in a position of preparedness, at least so far as the production of paper is concerned.

*A New Binder Twine*

The binder twine, used everywhere in the United States in connection with harvesting our crops, is at present made from sisal imported from Central America and Mexico. As a result of the disturbed conditions in Mexico, American twine manufacturers are seriously embarrassed for raw material. A substitute has been sought in paper twine, and experiments in this direction are still under way.

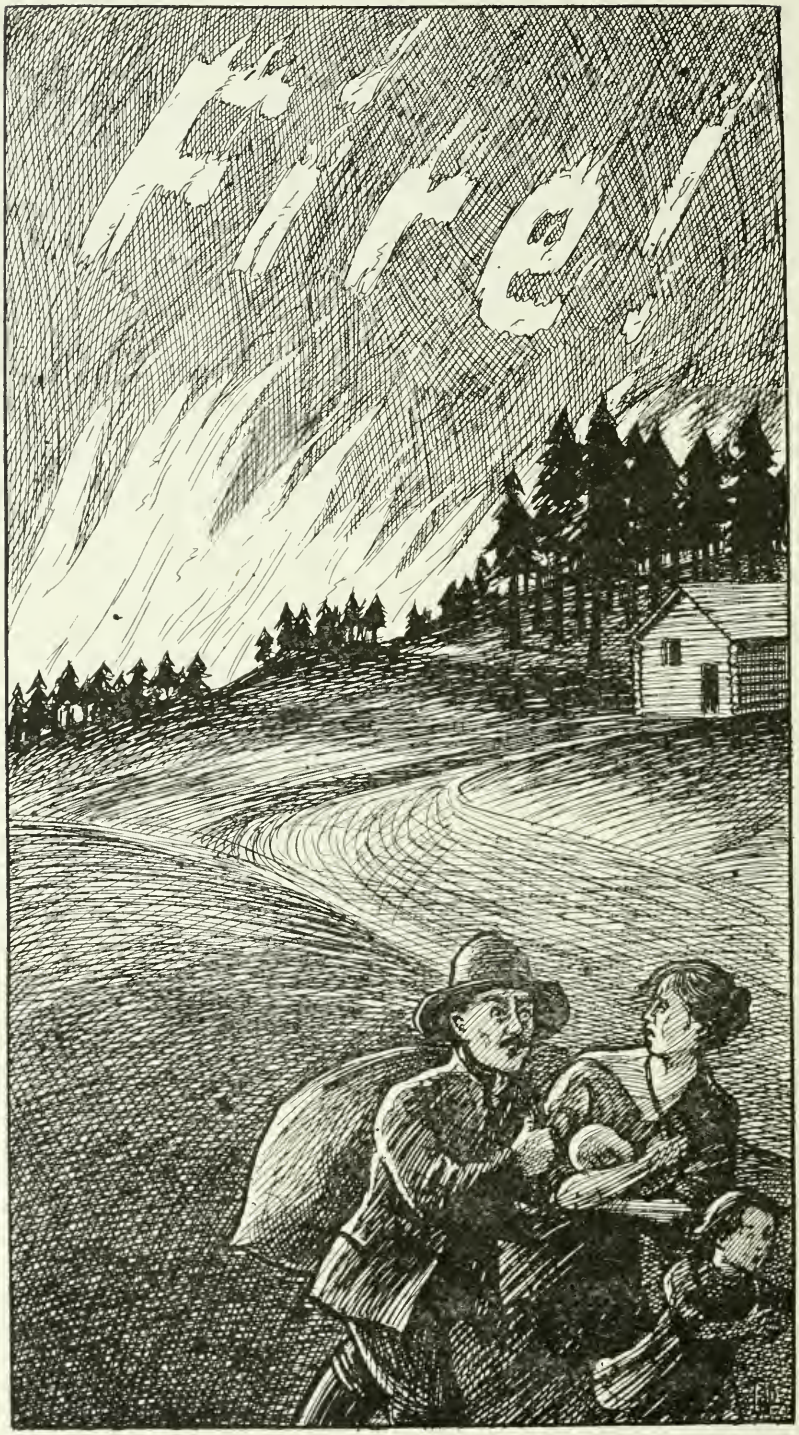
Strong cordage, ropes, burlap, and similar articles can be made from paper, and, in fact, are being made from it. Our common burlap and course bags are ordinarily made from imported jute. Shortly after war was declared the price of burlap bags increased so greatly that one large grain dealer seriously considered taking the profit to be derived from the sale of his reserve stock of bags and going out of business. In the case of a war of our own, the United States should be in a position, through its enormous supplies of wood fiber, to meet all, or at least the great part of, its needs for the twine necessary to harvest its crops and for substitutes for burlap bags and hemp ropes.

## *Contributing Members of the Canadian Forestry Association for 1917.*

Dr. Frank D. Adams.
Sir James Aikins.
F. H. Anson.
W. E. Bigwood.
Walter A. Black.
A. W. Boswell.
Geo. Boulter.
Reginald R. Bradley.
Mark Bredin.
E. R. Bremner.
Bronson Company.
W. R. Brown.
F. J. Campbell.
R. H. Campbell.
Thos. Cantley.
H. S. Cane.
R. S. Cassels, K.C.
R. J. Christie.
A. E. Cross.
M. L. Davies.
J. S. Dennis.
E. N. Dechene.
W. M. Dobell.
Edward L. Drewry.
G. Durnford.
Chas. E. Edmonds.
T. H. Estabrooks.
Thos. Flynn.
J. D. Flavelle.
Mrs. R. C. Fisher.
C. E. Friend.
W. I. Gear.
Geo. H. Gooderham.
J. L. Goodhue & Co., Ltd.
J. R. Gareau.
Hope Lumber Company.
Lt. Co. J. W. Harkom.
Claude C. Hockley.
Peleg Howland.
A. Jephcott.
R. M. Kenny.
Keenan Bros., Ltd.
James Kynock
Herbert Langlois.
Clyde Leavitt.
La Compagnie de Pulpe de Chicoutimi.
Montgomery & Sons Co., Ltd.
Miss McLennan.
Pearce Company.
Robt. E. Perry.
Wm. Pearce.
W. Gerard Power.
Powell River Lumber Company.
Capt. Wm. Robinson.
R. W. Reford.
Wm. Russell.
P. D. Ross.
Shives Lumber Company.
Chas. E. Spragge.
A. J. L. Trigge.
H. H. Wicksteed.

*Life Members of the Canadian Forestry Association in* 1917.

Robert Dollar.
David Gillies.
J. S. Gillies.
Godbout Lumber Company.
R. A. Snowball.


Fire!

# Ridding "Slash" From Western Lands

## Experience Proves that Lumber Operator Should Pile and Burn Debris at Time of Cutting.

*By R. H. Campbell, Dominion Director of Forestry*

In dealing with the protection from fire of the forests in the western provinces one of the things that forced itself on the attention of the Forestry Branch was the great quantity of dead material lying on the ground, partly as a result of fire and partly as a result of lumbering operations. This debris formed a serious menace and the conclusion was finally come to that an effort must be made to try and have all the debris of lumbering operations disposed of in some way to prevent this danger and to bring about the conditions of safety which are found in the European forests generally. Having obtained all the information possible from other places where brush disposal had been carried on as to cost and feasibility, a start was made on some of the forest reserves in Saskatchewan in the disposal of the brush from logging of jack pine timber. This was on small tracts in somewhat open and even aged stands without very heavy brush and on sandy land where the fire would not run very easily. The brush was piled as the operations went on and was burned later, and the results in clearing the land and removing the fire danger have been very satisfactory.

### *Tried Out on Spruce Lands*

Having found that this plan would work satisfactorily on jack pine lands it was decided to make a trial on spruce lands. A trial was therefore made on several small operations on the Riding and Duck Mountains in Manitoba and elsewhere. Spruce presents more difficulties than jack-pine inasmuch as the brush is heavier and the condition of the forest soil is not so satisfactory for burning. The covering of leaves, moss and other material on the forest floor under spruce is a dangerous carrier of fire and there is always a possibility of trouble arising from fire getting away in such a soil condition. However, the experiment was made on several operations in spruce with the result that it was found that both the piling and the burning of the brush could be carried on satisfactorily. *In the first place the operators were required to pile the brush while the burning was done by the forest rangers, but further experiment has demonstrated that the whole of the work can be done by the operator and, moreover, experimenting with the burning of brush immediately after the trees have been cut down has proved that the work can be done most satisfactorily and safely in this way.* This system is therefore being adopted in all operations in the future. By this system a small fire is started and the brush is thrown on it as it is lopped from the fallen tree, and is consumed immediately. No serious difficulty in the burning of brush in this way has been experienced although it has been tried under almost all possible conditions of cold and snow.

### *25 to 75 Cents Cost*

The cost of the brush disposal, so far as it has been possible to arrive at a figure, varies from twenty-five to seventy-five cents per thousand feet, board measure. The variation is not due mainly to the character of the forest but more to the experience and efficiency of the men who are handling the work. Where the operator has gone at the work with the intention of getting it done immediately and thoroughly the cost has, as his

men become experienced, come down to the smaller figure. Where the operator has gone at it with the idea of showing that it could not be done, the costs have been fairly high and have not been reduced later, with corresponding loss to the operator, as a result. On the whole the operators are satisfied that the burning of brush is a proper measure of protection to require and some of them have gone so far as to state that the disposal of the brush immediately as operations are going on has made the cost of disposal to them practically nothing as it has greatly facilitated the logging operations by having the brush out of the way.

The experience which we have had satisfies us that the brush can be disposed of satisfactorily and at a reasonable cost and that its disposal greatly reduces the fire hazard, and it is the intention to continue to develop that policy. It must be admitted however that our experience so far is on comparatively small areas and with small operations, and that it does not settle the question as to what methods should be followed in all cases. It is clear however that the system of brush disposal is a feasible one and that experimental work should be carried out without delay wherever lumbering operations are being carried on.

## COST OF SLASH DISPOSAL

*By W. T. Cox, State Forester of Minnesota.*

The cost of slash disposal work to the timber operators of the state averages about ten cents per thousand feet of timber cut. Considering that there are about three billion feet of timber taken from the woods of Minnesota each year, slash disposal costs about $300,000.00. This explains the fact that some of the more short-sighted lumbermen oppose the work of the Forest Service, but to the credit of the lumbermen in general it must be said that many of them are good enough citizens and good enough business men to see that this investment of theirs in fire prevention is well worth while in more than one way. The lumber companies pay not only the cost of slash disposal, but when fires occur, they furnish, on the ranger's request, big crews of men to fight the fires free of cost. This expense also runs into a great many thousand dollars a year.

## IDEAS!

**"Ideas do not take hold in proportion to their goodness," said the Editor of the Saturday Evening Post lately; "They take hold in proportion to the steam behind them."**

Has the reason for the existence of independent means of campaigning for forest conservation been better expressed? Some share of knowledge of Canada's shortcomings in forest protection and scientific management of timber crops is possessed by most members of provincial and federal governments. The 'idea' in itself is commended with enthusiasm. In the abstract it forms a common meeting place. But in practice, it seldom gets anywhere without the tireless aid of the private propagandist. Until all Governments possess advisory boards and put statesmanship above 'practical' politics the quickest and most effective way to get an idea adopted is to commence at the outside of the ring and construct a band of public opinion that sooner or later will prove politically irrestible.

One must not apply this formula in Canada too severely. Examples are by no means lacking where provincial and federal ministers have given effect to progressive ideas in forest conservation on the basis of personal judgment of their value. Such institutions as the Forest Products Laboratories at Montreal were not constructed because of political pressure but as an act of wise statesmanship. Many instances in the provincial fields illustrate the same point. It remains generally true, however, that in the United States and Canada ideas take hold, not in proportion to their goodness, but in proportion to the steam behind them.

# The Dawn of Forestry in China

How the Chinese people are slowly realizing the practical benefits of forestry practice in a land so grossly denuded is apparent in the following excerpts of a letter written by Mr. Joseph Bailie of the College of Agriculture and Forestry, Nanking, China to Prof. J. W. Toumey, Director of the Yale Forest School, under date of Dec. 28, 1916:

Since my return from the United States in the end of September, I have been trying to gather the threads of the work into my hands. The most gratifying feature is the manner in which the Chinese themselves are developing what is in their hands. As you are aware, the Colonization Association is so organized that, although we foreigners may give advice, the whole authority and responsibility is in the hands of the Chinese.

The second day after our return, my wife and myself paid a visit to Purple Mountain, and to my delight I found that not only had all the trees that had been planted before I left Nanking for the United States been protected, but that tens of thousands more had been planted, some on part of the old estate and some on places that heretofore we were not allowed to take charge.

### *A Good Beginning*

You may remember that when H. E. Chang Chien was Minister of Agriculture and Commerce, he granted our Nanking Branch of the Colonization Association the whole of Purple Mountain. Though this grant had been made in Peking, it was with difficulty that we gradually took in piece by piece, owing to the chaotic state of land laws and land tenure in this district. However, during my absence of the past year, the Committee has extended its control over the greater part of the mountain. Nor has this control been an empty name; the volunteer trees that would spring up and make forests in at least one-third of the vacant lands of this province, if protected, have been actually protected on the whole of Purple Mountain. This means that millions of these sprouts are now left standing. The usual thing is to cut these young sprouts along with the grass every year and carry all off when dried as fuel. Thus we have several sections of the mountain beginning to show signs of forest growth. Not only so, but the neighbors bordering on our mountain, seeing the common sense of what we are doing are also leaving young saplings to grow into trees, in places where heretofore all were cut off every year along with the grass, so that for miles beyond our mountain other mountains are now beginning to show that hundreds of the surrounding farmers are learning from us. This is perhaps one of the most encouraging features of our work, namely, that in so short a time so many are following in our footsteps.

But the progress made is not only in trees. More poor families have been given land to break up on the parts of Purple Mountain that have been taken charge of by our Committee.

### *Eighty Families Prospering*

At Lai An Hsien where there is another Branch Colony, the work has gone steadily on, until now there are over eighty families, numbering over 400 individuals, now settled among the mountains which less than three years ago were a wilderness and the only use to which they had been put was to cut a small quantity of the grass and brush for fuel, the great bulk of the mountains being burned over every year. These eighty odd families are nearly all on their own feet now. This wet year, while drowning out the crops of a great many farmers on the level lands, was just the thing for these people on the mountains, and the result was that their crops were on the average better

than those on the plains, and indeed equal to a good average year's crop on the plains. It is because of this that most of these industrious colonists are now safe beyond where famine or want looks them in the face, and most of them will be able to begin to pay back what was lent them to provide them with food while they broke up their little farms.

The discouraging feature for us in the University at present is that we haven't a single forestry professor yet, and our forestry students are rapidly approaching their third year.

Our school work is getting along nicely. Our Department has fallen heir to the greater part of the scientific outfit of the School of Medicine, which has moved from here to Tsinanfu, under this Rockefeller arrangement, so that now we are well equipped for biology, chemistry and physics. We are also giving the students pretty good training in practical nursery work, and they are having some forestry in classroom by our professors in Agriculture. But the time has come when we must have them in the hands of actual foresters.

JOSEPH BAILIE.

## *Paper Industry no Stronger than Forest Foundation*

*From "Financial Post."*

"The war—and attendant conditions—has given to the Canadian pulp and paper trade that impetus which was required to put this country in a very strong position in world markets. This impetus, resulting in a great development of output, should carry the industry through many of the adjustments which will take place with the end of the war.

It remains to be seen what part Europe may again be able to play in the world market when normal shipping conditions return. There are reports that Sweden and Norway have vast accumulations of pulp wood products awaiting a chance to market them in a normal manner. At the same time these countries are increasing their shipping facilities in a manner which indicates that they will become aggressive competitors in water borne commerce and will be in a position to market their own products to advantage. Then there is another potential competitor—Russia. The future alone can reveal what the development of the resources of that little-known country may mean, but it is safe to assume that there will be development after a war which has served to arouse a nation, fabulously rich, in respect to natural resources. Significant is an article which recently appeared in the Russian section of the London *Times* regarding progress on the construction of the new Murman Railway. In connection with the project, the vice-minister of agriculture, makes a statement respecting the resources of the region to be opened up in which special reference is made to wood pulp:—

*What of Russia?*

The vast timber areas (yew and pine) stretch for hundreds of square versts. These forest resources have been utilized to an insignificant extent. The northern governments abound in mountain streams, which, with their considerable incline, provide a multitude of waterfalls to be utilized for power for sawmills and wood-working factories. There are sawmills at Keret and some other settlements, but their number is very small. The extensive system of rivers and streams also affords opportunity to adopt the cheapest method of transporting timber—rafting it along these waterways. There is projected the construction of other more improved means of communication, which will also be of service to the timber industry. The Department of Agriculture proposes to afford the

widest access to the exploitation of the timber resources for the production of both lumber and wood pulp.

*Burning our Storehouse.*

Looking to the future then we see the possibility of the development of a great European competitor. That development may not be rapid but Canada's pulp wood resources are not inexhaustible. To insure our supply of raw material demands a policy which will protect standing timber against the ravages of such fires as have been experienced in Northern Ontario and the replanting of the vast areas which have been cut or burned over. These lands have small value from an agricultural standpoint and to use them to conserve our pulp wood supply would represent but little in the way of overhead. Some of the private companies are following a far-sighted policy in this connection in reforesting cut-over areas but to insure the future of our most important national industries demands a broad practical program on the part of provincial and Dominion governments.

# How Forest Reserves Help the Settler

## Saw Mills Located in Colonized Districts Supply Lumber at Minimum Cost.—A Successful Experiment.

The objects for which the Dominion forest reserves of the West are established are mainly to preserve the timber and make it available for the use of the people in the vicinity of the reserves, and for the development of the country generally. One of the most important uses of the reserves is to supply building material of all kinds for the settlers, logs, rails, poles, posts, etc., and in order to provide that the settlers may get the timber as directly as possible from the reserves a system of timber permits is provided by which a homesteader may get a permit for a considerable allowance of timber free of dues, and may thereafter obtain permits from year to year for such timber as he may require on payment of dues at a moderate rate.

*Service to the Settler*

The quantity of timber granted under permit amounts already to a considerable quantity each year, being in 1915 about 5,000,000 feet board measure of saw timber; 1,245,000 lineal feet of building logs; 393,000 fence posts; 598,000 fence rails. The settler can of course cut the timber required in the form of posts, rails or cordwood with the axe or with the small saw but when it comes to obtaining lumber he must either buy the lumber from one of the sawmills or he must take the logs cut by him under permit on the reserve to a sawmill and have the lumber sawn out. If he buys the lumber from the sawmill he must pay whatever the price is in the open market. If he takes his logs to the mill to be sawn he has to pay whatever the millman wishes to charge for the work of cutting the logs into lumber.

*Reducing the Middle Profit*

In order to assist the settler a stage further beyond the mere granting of the permit for the cutting of sawlogs the Department of the Interior has been experimenting in the last year or two with a policy of granting owners of mills the right to locate within a forest reserve and saw timber for settlers on the payment of a fee for the location of the mill and agreeing to saw up the logs at a reasonable rate. The method followed to ensure

the best possible arrangement to help out the settler is as follows:

*Lowest Price Assured*

A tract where there is a stand of timber sufficient to meet the requirements of the permits generally asked for in the district which is tributary to the portion of the reserve where the timber is located is examined by the forest officers, and is designated as a location for the cutting of timber under permits for the next season or two seasons as the case may be. The right to locate a mill at this point and to saw the timber for settlers who may obtain permits in the regular way is put up for tender, the notice being given by advertising in a newspaper and by putting up notices in the post offices in the district. Tenders are asked on the basis of the lowest figure at which the millmen will log and saw the timber for the settlers. Tenders are received up to a fixed date and on the date fixed the tenders are opened and the person who has agreed to log and saw the timber at the lowest figure is awarded the right to locate the mill. In order that the settlers may have full information on the rates which have been so fixed by tender, a statement of them is required to be posted up in a conspicuous place at the mill so that it can be read by any settler who is going in with his permit to obtain the timber he requires.

*No Hauling of Logs*

A number of mills have been operating on the reserves under this system, particularly on the Riding and Duck Mountain Forest Reserves in the province of Manitoba, and on the whole the experiment is proving satisfactory all round. The locating of the mills in the reserve close to the timber is a great convenience to the settlers who instead of having to haul their logs out are able to haul them out in the form of the lumber that they require. The settler also gets his logging and sawing done at the lowest figure that can be got, as the right is put up to tender to the lowest bidder. The timber operations have been carried out very satisfactorily on the whole and the tracts lumbered over in this way are being left in good condition for the reproduction of the forest. The brush and debris resulting from the operations is required to be burned and thus a very serious fire danger which usually follows lumbering operations is removed, while a good seed bed for the starting of the new forest is provided.

# Forward Steps In Forest Thrift

## Manitoba and Saskatchewan put Through New Laws and Promise Good Enforcement. Alberta Next?

Advanced steps were taken by the provincial governments of Saskatchewan and Manitoba at the last sessions of the legislatures in meeting the need for provincial cooperation in forest fire prevention. From the first suggestion of a revised Act respecting prairie and forest fires, the officials and Cabinet Ministers of the two provinces gave hearty reception to the representations submitted by the Canadian Forestry Association and made all efforts to secure an Act compatible with the aims of forest conservation. Manitoba's Bill, for which the Provincial Treasurer, Hon. Edward Brown stood sponsor, was the last to be dealt with at the session and received the committee's sanction practically with their final breath. Objections were raised by one of the northern members to the clause placing the onus of proof upon the settler and his objection was allowed. One or two other concessions were made before the Bill got through.

A penalty for carelessness with matches, lighted tobacco, etc. was included in the measure.

*One Dollar Reward*

Saskatchewan's Bill is in some respects a more tightly woven piece of legislation than Manitoba's. In the former province, a most valuable incentive is provided to ensure the prompt reporting of forest and prairie fires by the organized municipalities. For every fire so reported, the Secretary Treasurer gets one dollar. Saskatchewan has been paying fifty cents hitherto for building and other fires reported by the municipal clerk and the reward resulted in prompt and thorough local service. The increased pay will doubtless solve the question of getting a fire reporting service from officials not on salary.

Mr. A. E. Ham, Fire Commissioner of Manitoba, and his assistant Mr. Mulloy, and Mr. Arthur Fisher, who has charge of the insurance and fire work in Saskatchewan have exhibited a most praiseworthy progressive attitude in their relations to the Act revisions. Much was left to the judgment of these officers and their prompt assumption of responsibility for up-to-date legislation respecting forest fire prevention has rendered real service to their respective provinces.

*Tune up Municipalities*

Mr. Ham and Mr. Mulloy are now mapping out the Province and organizing their preventive plans. Mr. Mulloy will have supervision of the municipal fire guardians through their councils, and assurance is given that failure to deal with careless settlers in wooded districts will bring prompt action by the Fire Commissioner's office.

In both provinces, the new laws require settlers in forested areas to take out written permits before setting out fires. This is devised to secure supervision and safety. In organized municipalities, authority rests with the municipal councils to appoint fire guardians and such appointment is mandatory. In unorganized districts, the Lieutenant Governor in Council may appoint special guardians, and it is under this clause that the rangers of the Dominion Forestry Branch now on the ground will be given provincial powers over settlers. Lacking such authority they have hitherto been helpless to guard Dominion Crown lands against a most serious menace.

Alberta has thus far taken no action on the Association's suggestions for provincial co-operation. One proposal has been that the Dominion Forestry Branch define "wooded districts" in such general terms as would make their rangers responsible for prairie fires many miles from the edge of timber. This method is obviously unfair and cannot be the final basis. Sentiment in Alberta is heartily in support of better forest protection and an Alberta Government measure would be generally welcomed.

## SPINACH FOR PAPER

A French horticulturist, Mons. R. de Noyer has discovered that Spinach stems contain 46 per cent. of cellulose and make a paper equal to the Japanese product.

A WOODPECKER DESTROYING INSECTS
Contrary to a common belief the woodpecker is a most valuable conservator of tree life.

# BRITAIN— CALLS TO CANADA—

## THE FACTORY THE FARM

## She must have Food—

for her Armies in the Field—for her Workers in the Factory—in the Munition plant—in the Shipyard—in the Mine.

### THERE'S DANGER IN SIGHT—BUT YOU CAN HELP

**Do You Know—**

that the rapidly rising price of food stuffs means that the World's reserve supply is getting small?

**Do You Know—**

that a world-wide famine can only be averted by increasing this supply?

**Do You Know—**

that a "food famine" would be a worse disaster to the Empire and her Allies than reverses in the Field?

**You Can—**

help thwart Germany's desperate submarine thrust on the high seas.

**You Can—**

do this by helping to make every bit of land in Canada produce—the very last pound of food stuffs of which it is capable.

**And Remember—**

that **no man can say that he has fully done his part**—who having land—be it garden patch, or farm, or ranch—fails to make it produce food to its utmost capacity.

**THESE FARM PRODUCTS ARE NEEDED FOR EXPORT**

**WHEAT,**
**OATS,**
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OTTAWA

# Hitching Up With Public Sentiment

## How Pacific States Developed a Triple Alliance Between Timber Owners, Governments, and People for Conservation.

*Address by E. T. Allen, Western Forestry and Conservation Association, Portland, Oregon, at the Forest Conservation Conference, Montreal.*

We ought to feel a great deal of interest in the Protective Associations here because the movement really commenced with us. In 1906 in Idaho the Co-operative Timber Owners' Association started, and soon grew to four in northern Idaho, and spread from there to the State of Washington, and in Idaho and Washington, we fairly had only begun, when it was decided that the movement should be combined in the various States, interested at that time, and a sort of alliance was formed of which I was placed in charge. We have tried to bring the same results into Oregon, California and Montana.

### *The "Triple Alliance"*

We have not done much in California, except in the northern part, but there are now, I think, between twenty and twenty-four Co-operative Timber Owners' Associations in these five northwestern states, and we have a sort of a Grand Lodge in our Western Forestry and Conservation Association. It is a sort of a clearing house for these two dozen private patrol associations. That work began in 1909, and we immediately conceived the idea that we would not go very far if it was regarded as a timber owners' game only, and we realized that it must be a sort of a triple alliance, i. e., timber owners, Governments, (Federal and State) must work together in harmony, and then as far as possible better the scheme to avoid duplications.

### *Public Opinion Supports*

It soon turned out also that this association had a tremendously greater public opinion than any private patrol unit, because when a firm like the railroads or a timber company sent for their employees and told them to be careful of fires, they were not very much impressed, but when an organization representing altogether over a million acres of land, and on good terms with the State, with a strong public position, and a

good deal of influence, when they set at this thing, it took a sort of a semi-public status, and helped tremendously.

*Co-operation Ousts Fire*

We keep up the work through this large organization and the progress we are making in the technique of fire protective work is such that we have found it to be much better. We have found that much better work can be done by cooperation than anyone could do alone. After some little time we reached the position where we had 13,000,000 acres of timber land that were being patrolled by the association, and a little over 20,000,000 —between 20,000,000 and 25,000,000 acres of timber land that was beginning to think seriously of coming into line, and our local association worked with the State and the Government, not only in general harmony, but very often in a cooperative scheme in which we split the territory; we contributed so much to this scheme, so did the State, and so did the Federal Government. If our man happened to be the best man he would get the appointment as Warden and by putting on these men and by chipping in we are getting an organization together so that we have very little fire. We found we could control things in a normal year, but there come situations in an abnormal year that are very hard to cope with, and our efforts have been for four or five years to form our organization, not for a normal year, but for an abnormal year, and putting the three agencies together and combining the interests of all of them, we have been able to better meet the situation.

*What Publicity Does*

In publicity work dealing with the general education of the people, we have tried to make progress. We have had posters generally circulated and slides in moving picture houses, and I made arrangements with a

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film exchange, and they put in each film package a slide which we had prepared, and the moving picture owners were very obliging and agreed to show this slide during intermission between pictures, or at the most favorable opportunity, so as to give the people who were waiting an opportunity to think over this great question of fire protection.

We took the matter up with the superintendents of education, and got them to O.K. the plan and we tried to get cards or other matter into the North-western schools, and by so doing reached 400,000 children and their parents. We found that the only way of reaching the parents was through the children who, when this educational plan was given to them, would undoubtedly take the matter up and talk it over with their parents at home.

*Winning the Limit Holder*

With that little outline of our general methods, I will take up the question as to how to get timber owners into this patrol organization.

There are three ways to do it; one is simply voluntary joining, in which you persuade them it is a good thing, and that it is cheaper and better. That does not get all of them, as there are a great many selfish people who are willing to sit back and let you patrol their lands, as you have to do, in order to take care of each owner who is associated with us. We found after a few years that we had patrolled twice as much land as we could get money from, and had to do it just as well as our own, and consequently that was not very satisfactory.

*Putting on the Screws*

The next group of joiners came after we got our public opinion in our favor, and when people saw that we were getting to be a public or semi-public institution, and could get legislation, we got quite a number more, because the people got afraid and they thought they had better be on the band waggon than beside it, and a good many came in for that reason. But even that did not get all of them, so we tried an experiment in Oregon, and I believe it was the


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MECHANICAL PROPERTIES OF WOOD

**By Professor Samuel Record, Yale University.**

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THE PRINCIPLES OF HANDLING WOODLANDS

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THE THEORY AND PRACTICE OF WORKING PLANS (Forest Organization)

**By Professor A. B. Recknagel, Cornell University.**

In preparing this book the author has constantly kept in mind the experience which he gained while doing active work for the Forest Service in various parts of the United States.

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**CANADIAN FORESTRY JOURNAL,**

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first time it has ever been done in this way on this continent. We passed a law in Oregon which is the State law, in which we simply said that every owner of timber land must patrol his land during the season of fire danger, and if he did not do it, the State would do it for him and spend an amount not to exceed five cents per acre in any one year, and that this additional expense would be put on the tax roll for the man to pay, and if he did not pay the State would take the land away from him. In that way we worked this problem out. It took money for the State to take over a man's land and patrol it, and we had to have money to do it. We did not ask for an appropriation large enough to do that, but we simply allowed the State to provide this, and did not say exactly how the State was to meet the expense of this work, and the State immediately contracted with the existing patrol association to patrol this land. That is, the Patrol Association has to hold the sack, as it were, and has to pay for it that year, and then it puts in its bill to the State in the fall, and the next spring the State puts that man's land on the tax roll for that sum, with the penalty clause, for collection. We have to have money to do that, and we may have to borrow this money from the bank in order to do it, but the owner has to pay for it, and while it comes a year late sometimes, still it comes, and then the State pays under its contract.

Now, that law is very popular; there is very little objections to it, because it is a safeguard. It says that a man must patrol his lands—absolutely must—and if he does not, the State will do it for him, and it says that the land shall be patrolled adequately. The law says the patrol shall be adequate for the country to be patrolled.

*How Slash is Handled*

Nobody can ever complain of anything that this association does, because the association would be punishing itself if it asked anything unreasonable. We have in mind trying in Washington this year something new in the slash burning section. We have considered a great deal out there what is required for slash burning. We tried it by making it compulsory and some years this was a failure. Our system now is to allow that to be within the discretion of the State. We put in the law that the owner must remove any dangerous debris covering forest lands,—that any dangerous debris covering forest lands is a public nuisance, and the owner of it has got to abate that nuisance and if he does not do it the State can come in and the cost of the abatement is a lien against the property. So this and other sections in that bill I think, is going to be the correct way of carrying out what we are intending to carry out.

Our troubles are pretty well smoothed out, and I think it bears witness when I say that we have 13,000,000 acres patrolled by the association out in the west, and you can do it here if you get the cooperation of the State, the Government and the timber owners working together for the common good, and I do not believe that you can work this matter out in any other way.

---

## TO GIVE 2,000,000 TREES

After planting seedlings on the State forests, the Pennsylvania State Forester will have 2,000,000 trees left for distribution for private reforestation. More than half this number is white pine.

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## EXPERIMENTAL MILL

The Forest Products Laboratories of Canada, Montreal, are drawing plans for the erection of an experimental pulp mill. Researches are to be carried on in the making of sulphite and sulphate pulp, and the mill is expected to be of considerable benefit to the industry. A government appropriation has already been made for the purpose. C. B. Thorne, of the Riordon Pulp and Paper Company, and H. Helin, of the Wayagamack Pulp and Paper Company, are assisting the laboratory in planning the mill and the companies they represent are giving the services of draftsmen and engineers.

# Logged-Off Lands For Community Use

The Legislature of Washington will have before it a bill, the aim of which is the utilization of logged-off lands through community development. The measure is one of the results of the Logged-Off Land Conference held at the University of Washington, Seattle, December 8.

In this instance, a board of agricultural development commissioners is to be created in each county. Land suitable for such development is to be sold by the present owners to the board, which shall clear it and then re-sell it to the original owners at a price agreed upon when the first transfer was made or to new settlers, installment payments being provided in each case.

Many practical men have held that logged-off lands could be developed without attempting to follow the methods used for reclamation by irrigation. Water can be supplied to arid soil only by co-operative effort of a community, but in every timber state there is proof at hand that the clearing of land and growing of good crops on such land is not dependent upon community effort.

*Use Family Labor.*

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the encouragement of men, with families, who can find work in the logging camps or mills for a certain period in each year. Good crops can be raised by cultivating between the stumps, which can be removed as conditions permit, but success will be impossible if the settler is burdened with a purchase price in which heavy overhead expenses and promotion costs have been included, as the settler's capital usually consists of a big family and his bare hands.

*Survey Comes First.*

The first step toward the utilization of a tract of logged-off land seems naturally to be a survey and then its sub-division into plots so arranged that each settler will have access, if possible, to any stream flowing through the area and to the roads, which have been located prior to the purchase by the settler.

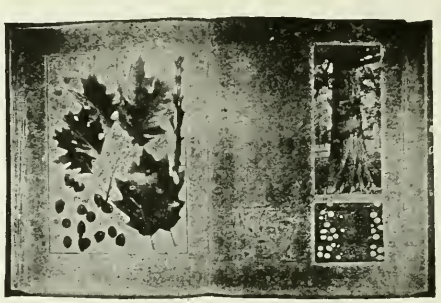
## REPLANTING SAND DUNES

The famous Sandbanks in Prince Edward county may be converted into a big reforestation plot. The drifting sand has covered several hundred acres of farm lands adjoining, rendering the property useless. A deputation waited upon Hon. G. H. Ferguson, Minister of Lands, Forests and Mines, Toronto, with the request that the Ontario government establish a reforestation scheme upon this barren waste. The Minister seemed favorably impressed with the suggestion and promised consideration.

## SERMONS IN TREES

*Exchange*

A good colored man once said in a class meeting—"Bredren, when I was a boy I took a hatchet and went into de woods. When I found a tree dat was straight, big, and solid, I didn't touch dat tree; but when I found one leaning a little, and hollow inside, I soon had him down. So, when dem debils gets after Christians he don't touch dem dat's straight and true, but dem dat lean a little and are hollow inside."

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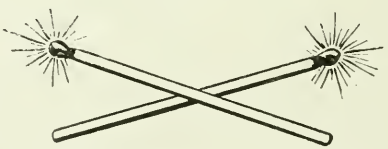

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# Making a Profit In Trees

Pennsylvania's million acres, which cost $2,275,000, are now valued at over $6,000,000. This increase is due to rising timber values, permanent improvement made by the Department of Forestry, and to tardy recognition of the fact that little trees grow into big trees and have an actual money value which is steadily increasing. Surely money put into an established business of this kind is an investment and not an expenditure.

# New and Interesting Publications

## Sent Free of Charge to Any Member of the Association

**"MON PREMIER LIVRE SUR LA FORET"**

32 pages, 25 photographic illustrations. An attractive booklet for French-speaking senior boys and girls. This edition will be distributed in many of the schools of Quebec, in parts of Ontario, New Brunswick and Manitoba. (Printed in French only).

**"THE WHITE PINE OF CANADA THREATENED WITH EXTERMINATION"**

An eight-page pamphlet, well illustrated, by H. T. Gussow, Dominion Botanist giving the most thorough discussion of White Pine Blister disease yet published.

**"YOUR ENEMY'S PHOTOGRAPH"**

A six-page folder with graphic fire picture in four colors. Published in French and English. Text deals with fire prevention.

**"WHO LOSES?"**

A four page pamphlet, illustrated, containing Question and Answer on a score of points commonly raised regarding the forest resources of Manitoba, Saskatchewan and Alberta.

**"FIRE!"**

A racy eight-page pamphlet, with cover picture of an approaching conflagration in red and blue. Contents include a sketchy talk on forest protection, and complete directions on "How To Build A Camp Fire." This booklet of special interest to guides, campers, sportsmen, etc.

The Forestry Association is carefully distributing large editions of all of the above throughout Canada, through the channels of branch banks, railroads, forest services, the clergy, etc.

If you believe you can assist this distribution, the Secretary will be glad to hear from you.

Lumber, pulp, paper and other wood-using industries can secure whatever quantity desired for local distribution at the bare cost of printing.

**By a recent ruling of the Association, our many 1917 special publications can be sent only to members who have paid their fees for the current year.**

## CANADIAN FORESTRY ASSOCIATION

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# A Modern Ranger System at Work

The excellent work of the Lower Ottawa Forest Protective Association during 1916, and the two previous seasons, was described in a paper by the manager, Mr. Arthur H. Graham, at the Forest Conservation Conference at Montreal, Feb. 1 and 2.

The patrol staff consisted of 57 rangers and 4 chief rangers. Experience had proved conclusively that the co-operative system of fire-fighting was the strongest and most efficient when the drought period came and men had to be gathered and hurried to fires with equipment. During three seasons' operations 457 fires had been extinguished, 560 miles of trail cleared, and the mileage travelled by rangers was 311,868 miles. About 300 miles of telephone lines had been constructed, five large towers erected, three of which were equipped with local and long distance telephone connections. During the first two seasons settlers were accountable for 50 per cent. of all the fires, but this had been reduced to less than 15 per cent. *The opposition to the permit system had almost vanished.* They had more success in controlling fires and confining them within a certain area than in completely extinguishing them.

In 1914 the number of fires extinguished was 154; in 1915, 155; and in 1916, 148. The total area burned over, including private lands, was: 1914, 297,996 acres; 1915, 20,715 acres; and 1916, 8,637. The merchantable timber scorched was: 1914, 16,624,325 b.m. feet; 1915; 6,607,450 feet; and 1916, 858,620 feet. The cost of operation for patrol, including all accounts except for fire fighting, had not exceeded $1.50 per square mile, or less than ¼c per acre. No fires had come to their territory from the St. Maurice territory, which adjoined, but this could not be said regarding the Upper Ottawa area (which included licensed crown lands to the extent of 16,000 square miles), where fire ranging was done by the private system of patrol. A number of the companies were doing a great deal to prevent fires, and were spending two or three times more money patrolling and fire fighting than they should have to spend because of their neighbors' carelessness and lack of proper patrol of their limits by competent rangers. Mr. Graham's remarks were backed up by a licensee who owned extensive areas in the Upper Ottawa district. *Thirty-five million feet of merchantable timber scorched was the estimate of damage done by two fires that reached his limits in an uncontrollable state, notwithstanding the fact that he spent* $3.80 *per square mile patrolling, and an additional* $2 *per square mile was spent for fire fighting.*

---

## THE ANCIENT POPLAR TREE

When white men settled in America, the Indians were making canoes of the yellow poplar. This was really the beginning of the last chapter in its life. Earlier chapters have been dug out of rocks and clays where its leaves and flowers have lain buried during thousands and millions of years. This tree appeared after the coal beds were formed, but before the ice age.

There were sixteen species of the tree then, extending to Greenland as the climate was warm. At that remote time yellow poplar grew in Europe where it no longer exists. Fifteen species perished in this long winter known as the ice age. The species that survived was probably then growing south of the region of extreme cold and when the ice finally melted, it worked its way north as far as Canada.

---

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# STAG

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# Forest Policies Demand Revision

In the annual report of the Committee on Forests of the Commission of Conservation, reference is made to the forest protection situation in Ontario, Quebec, New Brunswick and Nova Scotia and the prairie provinces and certain recommendations are made. Forest protection in Quebec, the report states, has received the hearty sympathy of the provincial authorities. It is believed however, that the importance of this work fully justifies, and in fact urgently requires, a greater degree of financial support from the provincial treasury than it has thus far received. Under the present system, the attention paid to the protection of unlicensed lands is inadequate. The situation urgently demands the assignment of a much larger force of inspectors for licensed lands, the employment of an adequate staff for the protection of large areas of unlicensed lands, in order that they may remain or become productive and provision for a sufficient head-office staff to maintain proper control over the entire organization.

*Nova Scotia.*

It is suggested that eventually, the province should embark upon

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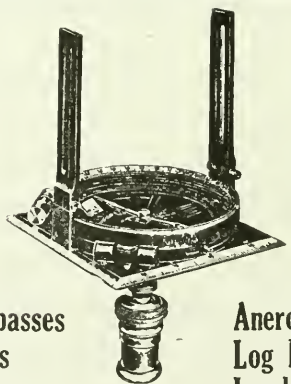

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a policy of reacquiring cut-over and burned-over non-agricultural timber lands, to supplement small areas of Crown lands. In this way, and at relatively small expense, the province can gradually re-establish the basis for a comprehensive policy of forestry practice on Crown lands. The necessary legislation already exists; only the required appropriations are lacking.

*British Columbia.*

The need for men trained in the theory and practice of forestry has become so urgent in the west that the University of British Coumbia has decided to establish a forest school at Vancouver. This action is to be commended, and it is to be hoped that it may be made effective at an early date.

The Forest Branch has, through its own organization, made a remarkable showing in the development of new markets, both foreign and domestic, for British Columbia timber.

*Dominion Lands.*

Progress has been made in the matter of brush disposal in connection with timber sales in forest re-


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serves. This policy is becoming well established and the beneficial results are apparent in the form of decreased fire hazard.

On the other hand, there is no progress to report in connection with the enforcement of the technical forestry regulations on licensed timber berths, these not being under the jurisdiction of the Forestry Branch. A large percentage of the merchantable timber on Dominion Crown Lands is included within these licensed timber berths, and the fact that there is no provision for a technical administration of cutting regulations on these lands is a complete anomaly. Under the present plan of adminstration, the forestry experts of the Dominion Government are completely cut-off from any direct administrative contact with cutting operations on lands which contain the great bulk of merchantable timber on Dominion Crown Lands.

---

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# Going Camping?

It was early morning on Lake Golden. The teapot sputtered over the coals, and bacon flavors filtered gratefully to the nostrils. The Old Veteran squatted himself comfortably on a granite boulder and nodded toward the fire. "Boys," he said, "there don't look to be anything dangerous in a little bunch of coals, does there?"

"Not this side of a powder factory," chipped in the Youngster.

The Old Veteran tapped his pipe bowl significantly: "Some day we're going to have an argument about which is the trickiest spot to trifle with fire—a powder factory or a forest, and I think the forest will come first. One advantage about the powder factory is that you know the worst right off. But in the forest you may walk away for days and have the fire of your own making overtake you."

"That doesn't sound reasonable," the Youngster broke in.

"And it won't," agreed the Veteran, "until some time you start a camp fire in a bog or on pine needles and after a week's absence come face to face with your own fire in the shape of a blackened township. There's lots of surprises in store for you, my lad. I have known camp fires to burrow into a boggy soil, although doused with many pails of water, and remain there for two weeks, travelling underground until they came in contact with the dry duff of a fine old pinery, then to dart upward and turn hundreds of acres into a roaring furnace. The only safe way is never to take chances with a camp fire, never build one except on rocks or gravel and never go away until it is *dead out*. I have followed that rule now for twenty years."

"You certainly make the camp fire responsible for a lot of damage."

"Can't exaggerate it, because I have seen the proofs with my own eyes. I have crossed Canada with parties of geologists and civil engineers and forest engineers and seen so many thousands of acres lying charred and useless, so many rivers and streams dried up from lack of a tree life, so many beautiful camping and fishing spots spoiled for all time, that I said to myself, 'Never you become responsible for this sort of crime.' And I believe I have lived up to it."

"But *smoking*!" said the Youngster "Suppose that I"——

"Suppose that you threw down a lighted cigarette or a burning match alongside the trail, or emptied hot pipe ashes, I should feel like giving you a very good licking. Lighted tobacco and matches are just campfires in concentrated form. They all have the possibilities of another 'Porcupine fire horror,' and for a man to carelessly toss away the beginnings of a conflagration is to brand himself an amateur woodsman and an enemy to society."

By this time we had made away with the bacon and were glorying in the nectar of campfire tea. The Youngster, of course, had finished first, and was lending a hand at striking camp.

Up from the shore came the guide, lugging two pails of water. He emptied them on the small bed of coals and returned for a further supply. Not until the fourth pail had immersed the blackened remnants of the fire did he look contented.

"I see you take no chances," remarked the Veteran.

"I too learned my lesson," answered the guide. "If the forests are not kept *green*, there's no hunting and fishing, and no tourists—and the guide's job disappears. This is only self-defence."—(Reprinted from "A Matter of Opinion," published by Canadian Forestry Association.)

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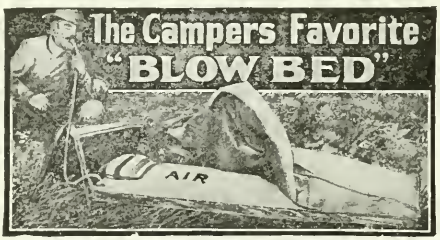


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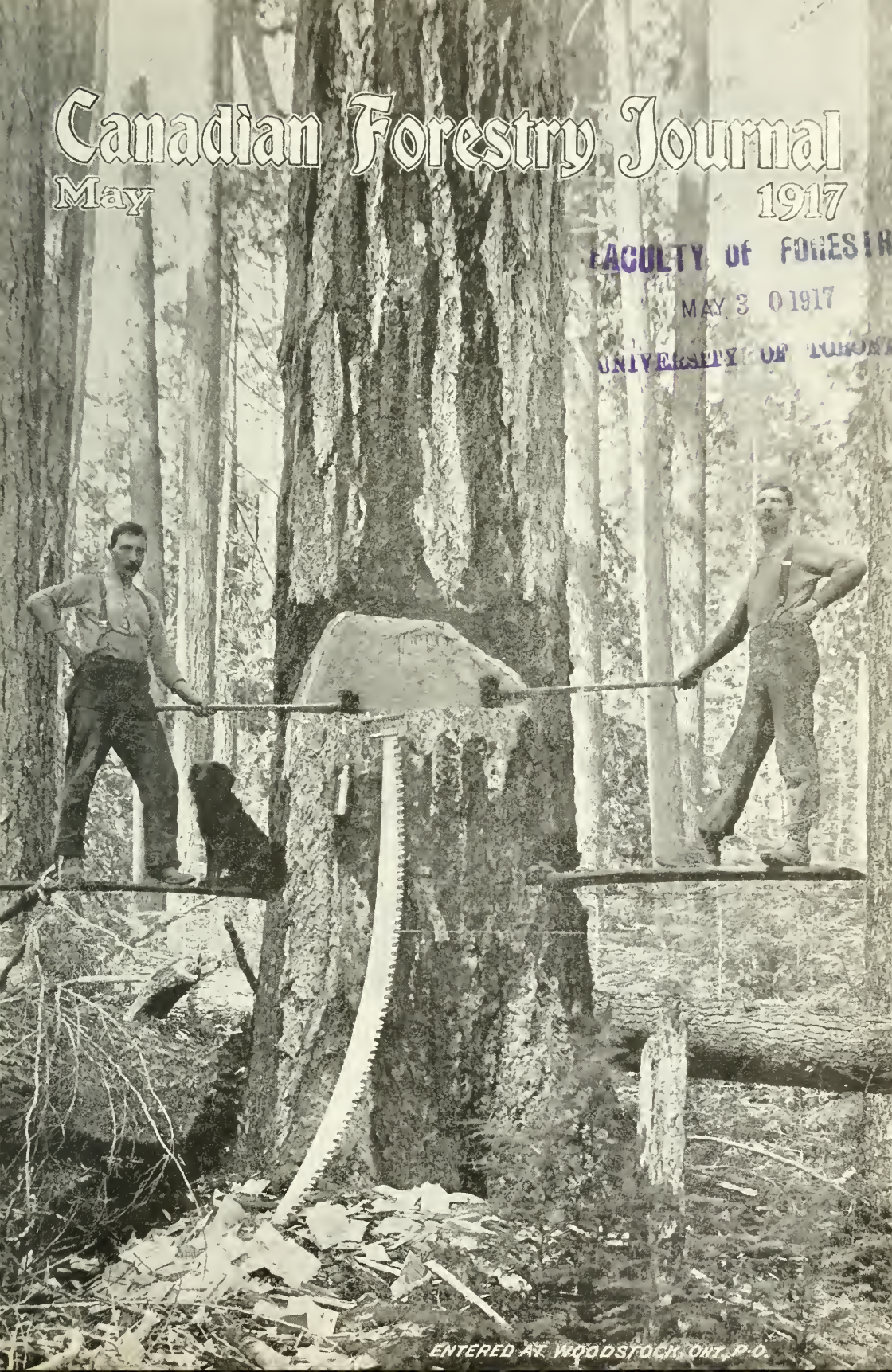

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Vol. XIII

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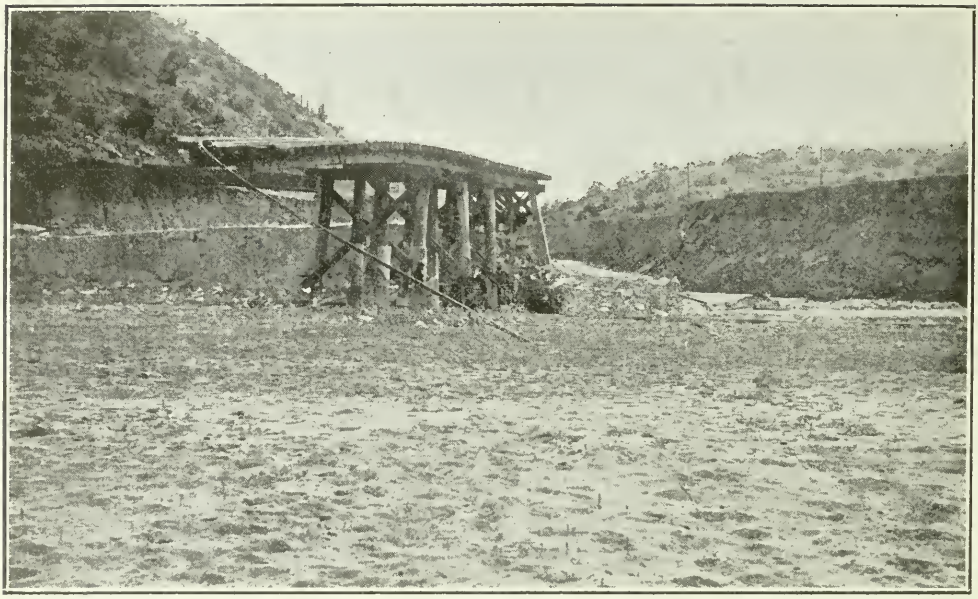


DIVIDENDS FROM DESTRUCTION OF WATERSHED FORESTS :
A Colorado railroad trestle left standing in midstream after washout in spring of 1914.

AN AREA CLEAR CUT YEARS AGO FOR CHARCOAL AND LATER BURNED.
Note the high stumps, lack of reproduction and erosion in right foreground.
Photos by courtesy U. S. Forest Service.

# Scientific Investigation and the Forest

## While Other Nations Forge Ahead in Research Work in Living Forests Canada Pays Small Heed

The forests of Canada are one of its leading natural resources and like forests everywhere are, as living bodies, subject to laws of development that can be ascertained by careful study. The growth and production of the forest are affected by conditions of soil, moisture, air and light, by the relations between species and their adaptability to differing conditions, by destructive agencies such as fire, insects, fungi, etc. While the forests are subject to and often succumb to destructive agencies, on the other hand they are capable of reproduction and development. They may be perpetuated for all future time and their production and value can be increased by proper management. The conditions of forest growth are therefore a subject for thorough scientific study.

### *Principles of Management*

Every country which has come to the point where it felt the need of managing its forests for better production has seen almost immediately as a necessary consequence that special provision must be made for scientific study of the forest to determine the principles of management that must be followed. Russia, Sweden, Germany, Austria, France, Switzerland, British India, the United States of America, have all organized specially for such investigations.

Russia presents perhaps the nearest comparison to Canada in extent, climatic conditions, forest area, etc., but in the general conception of the public is not considered as a progressive country. Russia has however for many years had established a system and organization for the scientific study of its forests and the reports published by the institutions established for this purpose are among the most suggestive and valuable of any reports issued by the forest service of any country. The central organization for forest investigation is the Imperial Forest Institute at Petrograd which was founded 110 years ago at the same time that the Russian Department of Forestry was established. This institute, like most European institutions of higher learning, is a school for training foresters as well as carrying on research work. In 1915 there were employed fifty-four professors and instructors and the number of students was 648. The institute comprises twenty-three buildings, thirteen laboratories and museums and a splendidly equipped dendrological garden. The appropriation for the year was $119,000. The results of investigations made at the Institute are published in its transactions which have now reached to twenty-five volumes in number. These include various papers on the effect of climate on forests and forest reproduction, the forest types in Russia, the technical qualities of the woods, etc. Forest investigations are carried on at other forest schools, especially at Novo-Alexandrovsk, near Warsaw, and at the Riga Polytechnicum.

### *Twelve Experiment Stations*

There are also twelve Forest Experiment Stations in Russia, the total annual appropriation for which is about $60,000, where special field investigations in the planting and propagating of the forests is carried on. The results are published irregularly as material accumulates.

At the central office of the Forest Department at Petrograd there is a special committee on Experimental Research Work, the chairman of which is directly responsible to the Director of the Forest Department. Every year, usually in February, there is a meeting of the Central Committee for investigative work held in Petrograd which is attended by all the Superintendents and assistants from the experimental stations. To the se

meetings are also invited professors of forest schools and specialists in allied lines of research such as plant physiology, ecology and meteorology. At this meeting the work of the past year and plans for the next year are discussed, the studies to be carried on for the next year are decided upon and allotments of funds are made for each project.

*United States' Attitude*

The United States has an area about equal to Canada and forests of somewhat greater extent and value. That country however had not proceeded far in organizing for the proper management of the forests before it found that there was not sufficient knowledge of the principles that underlay the development of the forest or the influences that affected it. Provision has therefore been made on a fairly large scale for the study of the forest by the establishment of nine Forest Experiment Stations, the maintenance of which requires an expenditure of $215.000 per annum. This is in addition to the Forest Products Laboratory at Madison, which deals with the wood after production and removal from the forest, the appropriation for which is $180,000 per annum.

The following from the Review of Forest Investigations by the Forest Service of the United States, is quoted:—

"The experimental work as now conducted at the Forest experiment stations is by far the most important. For the last few years it has been felt that only by well-ordered experiments can empirical procedure be replaced by truly scientific procedure.

*How U. S. Scheme Works*

"Advantages of economy and greater efficiency in conducting investigative work in silviculture at an experiment station are apparent. Under the old system of conducting investigative work, assignments to an extensive area were usually necessary, to which the observer could devote but a short field season. Under the system of Forest experiment stations, specially trained men are permanently assigned to a given region with which they have an opportunity to become thoroughly familiar and therefore are capable of conducting the work with the greatest effectiveness and least expense. Each of the experiment stations is allotted an area sufficient for the proper handling of short-period experiments, for experiments requiring a number of years, and for the maintenance of large permanent sample areas which serve as models typical of the silvicultural region. Such areas furnish the most valuable, instructive, and convincing object lessons for the public in general, for professional foresters, lumbermen, and owners of forest land, and especially for the technical and administrative officers of the National Forests.

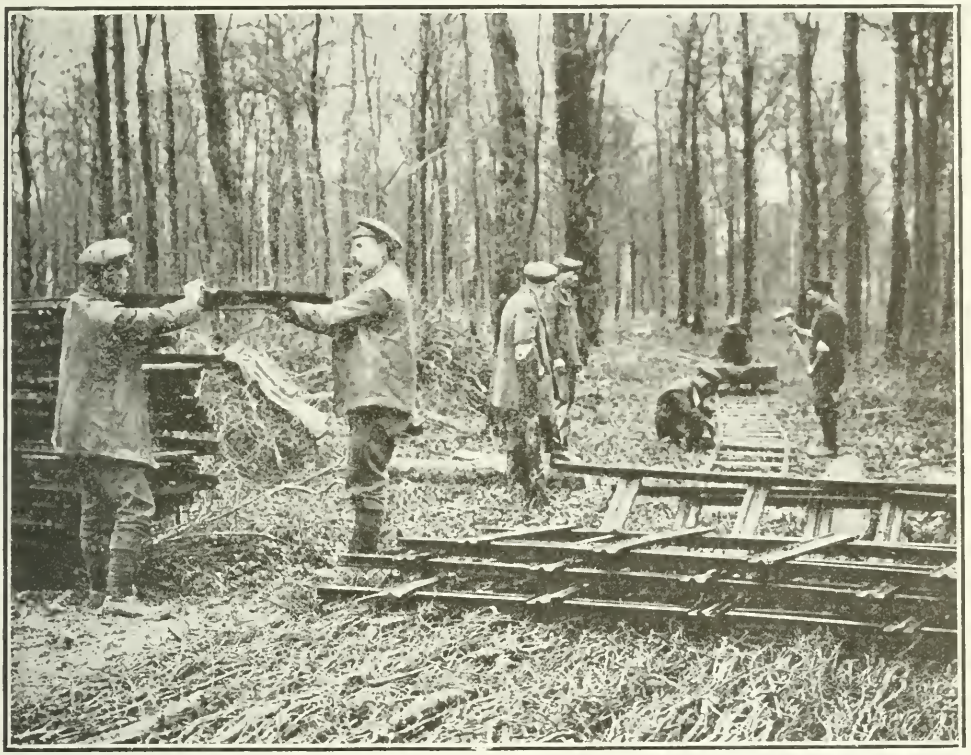
"The organization of the Forest experiment stations made possible the use of uniform methods in dealing with forest problems. General problems are treated at the different stations simultaneously; local problems in the region to which their results apply. All of the modifying factors which enter into the results of experiments are measured by observations covering many conditions and years and are thus determined once for all with the greatest economy and the least duplication of work.

"The stations are distributed in such a way that one station is located in each of the silvicultural regions of the West. A single Forest, representing as much as possible the conditions typical of the region, is selected and a portion of this area set aside for the purposes of the experiment station."

*Export Trade in Timber*

In Canada the forest resources of the country have been one of the great wealth producing factors. Production is urged on the country as a national duty and particularly production for export so that Canada may in this way meet the great debt which the war requires her to undertake when the production of the forest is looked at from this point of view. The figures of the total production from the forests have not been obtained in a sufficiently accurate way to give a reliable statement for any lengthened period. For

# Getting Logs to the Mill at the "Front"



(British Official Photograph)

LAYING A LIGHT RAILWAY ON WHICH LOGS WILL BE BROUGHT TO A NEW SAW MILL IN NORTHERN FRANCE

the last few years from 1912 to 1915 the production from the forest has been from $172,000,000 to $177,000,000.

Accurate figures are however available as to the value of exports from Canada and the total for the years 1868 to 1914, that is, from Confederation to the present time, show that the contribution of the forest toward the payment of the public debts owed outside of Canada has been very large.

*Value of Canadian Exports from 1868 to 1913.*

| | |
|---|---|
| Agricultural Products | $1,625,890,767 |
| Animals and their Produce | 1,566,701,217 |
| Forest Products | 1,322,646,431 |
| Mineral Products | 731,514,593 |
| Manufactured Products | 571,049,221 |
| Fisheries Products | 143,233,427 |

It will be seen that the forest is second only to the farm in the supply of goods for export. It is considerably larger than the export of the mines or fisheries. A considerable proportion of the manufactured products is also to be credited to the forest.

*Public Revenues from Forests*

Further, the forest has been considered and used as a source of direct public revenue in Canada. So as to accomplish this more fully the title to timber lands has been kept in the Crown and the state has not only received a purchase price for the timber but a rental for the ground and royalty on the timber taken out. The annual revenue of the different governments in Canada which own

timber lands amounts to seven million dollars. The production of the forest is therefore one form of production which is worth giving consideration to and assisting in the interest of the development of Canada.

The quantity and value of the products from the forests depends much more on proper management based on scientific principles than the public generally are aware. As an example, Saxony, between 1817 and 1893, increased its output per acre from the forest lands of the kingdom by fifty per cent., increased the proportion of timber from seventeen to seventy-nine per cent., increased the gross revenue from $1.75 to $6.67, and the net revenue from 95 cents to $4.37.

*Investigation Work in Canada*

In Canada the State has recognized the necessity for scientific investigations of the natural resources of the country in the field and in the laboratory.

The Department of Agriculture was established for the purpose of scientific research in matters relating to agriculture and the many divisions into which such work inevitably develops have now grown into a large well-equipped and progressive department with an expenditure of nearly four million dollars per annum. It should be noted that the Department of Agriculture is almost wholly an investigative department, not an administrative one. It does not administer the agricultural lands of the country. The agricultural lands it does administer are the experimental farms where experimentation is the main purpose.

The Department of Mines similarly was organized to make investigations in connection with the mineral resources of the country. No more than the Department of Agriculture is it an administrative department. Its expenditure of about eight hundred thousand dollars per annum is devoted through the two divisions of the Geological Survey and the Mines Branch to investigation in the field and in the laboratory for the study and development of the mines of Canada. And it has a long and useful history of achievement behind it.

*Where Policies Need Bracing*

In connection with the forest wealth of the country, a resource which bad management or neglect can destroy so easily and which responds so readily to wise management by increase in production, there has been no special provision for scientific investigation until the recent establishment of the Forest Products Laboratories of Canada in connection with the Forestry Branch of the Department of the Interior. But these laboratories only deal in research on the dead material and the expenditure for this purpose which is about $60,000 is small compared with either of the investigative departments mentioned. But further there is no special provision made for scientific research in the forest, such desultory research as is carried on being merely an incident to administrative work in the management of the forest lands of the country. There are no forest experiment stations in Canada. There is no broad, sound, scientific basis being laid for the management of the forests and the lack of it is being felt and will be felt more as time goes on, as the drain upon the forests continues to increase as it is doing steadily to-day, and as the present low average of production by growth in the forest consequent on forest fires and unscientific management is realized. The time is surely ripe for providing in some measure for formally beginning the scientific investigation of the forest and its life processes which are so essential and fundamental.

---

Some of the biggest forest fires began with a single wisp of flame. At the start, a child could stamp it out. At the climax not a battalion of forest rangers could stay its vicious sweep. Whole townships pass beneath the pall of smoke and smothering heat. Farms and villages are turned to shambles. Lives and untold property heap up the awful penalty.

# Protection of Birds a Farm Asset

BY C. C. CLUTE

IN "OUR DUMB ANIMALS"

If one tenth of all the agricultural products raised annually in the United States were scattered over different sections of the country where most needed, would it help fight the high cost of living? Statistics show that annually there is a loss of between $800,000,000 and $900,000,000 in the agricultural products of the United States, all due to the ravages of insects.

This fact was cited recently by a leading Chicago paper, and it was further cited that the loss might be materially lessened were birds protected as they should be. When one of the leading metropolitan newspapers of the land advocates that every available plot of ground be turned into a garden spot and cultivated, and when in the same issue that same paper urges that birds be protected that they might destroy insects, it is surely time for every one to consider what part he is to do in the work, and, insofar as possible lend a hand in doing his mite. One insect destroyed in the spring means the destruction of hundreds, and in some cases thousands, ere the summer is over.

Government statistics and personal observations show over and over again that the birds are the farmers' best friends, which, in return for their services, ask only protection that they may bring forth more enemies of insects.

Just how is this protection to be given? Happily the time is passed, or nearly so, when the farmers think that the birds must be destroyed because of the fruit they eat. In comparison with the amount of good they do, the amount of fruit eaten by birds during the summer is an infinitesimal matter,—a mighty good form of insurance for the farmer.

But there is another way in which the birds require protection, and that is protection during their nesting season. Not only should prowling cats be restrained and egg collectors either be made to see the folly of their heartless whims or else be summoned before the law, but provision should be made for the nests. Birds like company. Even the bluejay, usually termed a rascal but at heart a boon companion of the farmer, likes to have his nest near a dwelling. The robin appreciates forked sticks placed in trees for him, and the wren, bluebird, and purple martin enjoy the companionship of man as soon as they learn that he is their friend.

The best way to get on amicable terms with birds is to build and put up bird-houses and see that such are not destroyed by boys or preyed upon by cats. Put up a single birdhouse this summer if you are a skeptic and watch the wren, or bluebird, or purple martin, as it feeds its young, taking note of the kind of feed it uses and the number of trips made per hour. Keep a record of this for a few hours, estimate the good done in a day, in a week, in a month, and in a nesting season, and you will be wiser the following year.

I know one farmer in particular who lost, during one summer, three rows of corn forty rods long. The corn grew next to a fence row heavily sodded with blue grass, which produced swarms of grasshoppers. For the sake of experiment alone, for this farmer was a skeptic, last spring he put up twenty-one bird-houses, placed two rods apart on the fence along the forty rods. The houses were some that he and the boys had made during the winter months, from dry-goods boxes obtained in town. Thirteen of the twenty-one houses were inhabited during the following summer, six by wrens, four by bluebirds, and three by colonies of purple martins.

The grasshoppers that summer

made a rich living for the birds, and when the fall came, that farmer had the satisfaction of gathering twenty-three bushels of corn from the three rows that grew next to the fence, right where there was no corn at all the year before. With corn selling at fifty-five cents per bushel, it represented a saving of $12.65 for that year alone, and with the same insurance for the following year with no outlay at all. Does it pay? Boys, get busy. Get your fathers to figure with you how much corn growing next to a fence row is destroyed by insects, and then see if your fathers will let you put up bird-houses and pay you the difference for the first year.

## The Case for The Woodpecker!

"What good is the woodpecker?" Letters reach the Canadian Forestry Journal asking this question and in many cases proceeding to answer it with threats of extermination for all woodpeckers seen about the correspondent's property.

It would appear that only the Yellow-bellied Sapsucker should be regarded as detrimental to tree life, and that all other varieties are to be encouraged. The following article by Dr. Gordon Hewitt, Dominion Entomologist, will be found of value:

*Woodpeckers as Insect Destroyers*

A Canadian bank manager recently boasted that he had shot seven woodpeckers in succession in his orchard, evidently under the impression that he was performing an exceedingly meritorious service to the community. He was destroying one of our most active insectivorous birds and, though keenly interested in the conservation of his trees and of our forests, he was destroying a most useful ally in their preservation. Boring insects are deadly pests of trees, and woodpeckers are their special enemies, as they are able to reach these pests so secure from other enemies. No birds are more useful in the protection of our forests.

With the exception of the Sapsuckers, our woodpeckers rarely attack healthy trees and are among the most beneficial of our insect-destroying birds. The Yellow-bellied Sapsucker has a black patch on its breast, while the top of the head from the base of the bill is red. These marks distinguish it from all other woodpeckers. It girdles the trees with holes in securing the sap which forms part of its food.

The different species of woodpeckers are the most important enemies of the bark-beetles and timber-boring beetles, these being the chief enemies of our forest and other trees. About seventy-five per cent of their total food is animal food and this consists chiefly of insects, among which the wood-boring beetles predominate. The Common Flicker is a great destroyer of ants, particularly on lawns, as many as 5,000 ants having been found in the stomach of a single bird. The little Downy Woodpecker and Flicker should be encouraged to come into gardens. They will readily accept nesting-boxes and the encouragement of these birds is the best insurance policy that the tree-lover can take out.

### PENNSYLVANIA FIRE LOSSES

The report covering the spring and fall forest fire seasons of 1916, issued by the Pennsylvania Department of Forestry, shows that while almost as many forest fires burned in Pennsylvania in 1916 as in 1915, the area burned over was less than half that of 1915, and the timber loss was only a trifle over one-fourth as large.

# New Brunswick Probes its Forest Contents

## Survey Discloses Interesting Conditions Showing Need Fire for Prevention and Attention to Reproduction

The Survey of the forest possessions of New Brunswick has now reached a point where many very instructive conclusions are available. In making his report to the Government, Mr. P. Z. Caverhill, director of the survey, states that of a total of 7,500,000 acres of Crown Lands, 550,000 acres have been surveyed and examined by the field parties. The mapping and compiling of 371,000 acres have been completed.

Of the total area examined, 82,270 acres have been burned by fires of fairly recent date. Had this area not been burned over there would have been, besides the amount logged from time to time, merchantable timber worth at least $714,000 and the harvesting of this would have yielded the people of the Province through wages, etc. $4,000,000.

Assuming that this burned area represents an average of Crown Lands the loss to the Province in stumpage during the past forty years has been some $14,280,000, and some $80,000,000 that could have brought into the province by the sale of lumber products has been turned elsewhere.

The forest land of New Brunswick could be adequately protected by an annual expenditure of three quarters of one per cent per acre—$50,000 to $75,000 per year. In order to save the expenditure of $75,000 per year "it would appear that we have during the past forty years lost in stumpage $14,000,000 and have turned into other channels $80,000,000."

"Confronted with these facts what will be the future answer to the forest protection question?" asks the report.

### *What the Survey Shows*

On 371,000 acres, 76 per cent was found to be covered with merchantable timber, and less than two per cent with second growth of less than merchantable size. Eleven per cent has been burned in times past but now contains young forest growth in sufficient quantities to replace ultimately the former forest. On nine per cent of the area mapped, fires have caused such damage that satisfactory reproduction has been made impossible. Of the remaining, two per cent, less than half represents the area of lands cleared or cultivated, and the balance is made up of caribou barrens, cranberry bogs, swamp land not supporting commercial growth, etc.

### *$300,000,000!*

If it be assumed that the 271,000 acres mapped to date is fairly representative of the 7,500,000 acres of Crown lands, the total stand will be in the neighborhood of 16,220 million feet, estimated to be worth in stumpage at least $48,000,000. Mr. Caverhill estimates that the harvesting and marketing of this crop will distribute among the people of New Brunswick not less than $300,000,000.

### *The Timber Contents*

The commercial timber on the 282,064 acres of timber land is estimated as follows:

| | | | | |
|---|---|---|---|---|
| Spruce | 139,506 | thousand | broad | feet. |
| Fir | 96,627 | " | " | " |
| Pine | 19,210 | " | " | " |
| Cedar | 34,821 | " | " | " |
| Hemlock | 7,474 | " | " | " |
| Maple | 30,034 | " | " | " |
| Birch | 97,956 | " | " | " |
| Beech | 12,838 | " | " | " |
| Other species | 8,366 | " | " | " |
| Making a total of | 446,862 | " | " | " |

There is in addition to the above 583,138 cords of spruce and fir pulp, 60,901 cords of poplar pulp, 84,346 cords of white birch spool wood, giving a total of 728,385 cords, which, assuming that two cords will equal one thousand board feet, will be equivalent to 364,192 thousand board feet, making a grand total of 811,064 thousand board feet on the 282,064 acres of timber land, or an average of 2900 feet per acre.

### *Fire Guarding Reforms*

The Canadian Forestry Association is confident that the new Government of the province will not only give to the Forest Survey ample support, but will lose no time in giving effect to the most obvious and pressing requirement of adequate fire protection. To keep fire out of timberlands is the starting point of any forestry policy and by the aid of skilled organization can relieve New Brunswick of further responsibility for gross waste in a highly valuable asset. New Brunswick's present fire protection arrangements as applied to the forests are out-of-date and costly. Given a forestry department centralizing control of the forest survey, timber sales, fire protection and some measure of forestry practice as conditions require and from the first year's operations the province will begin to reap rich dividends.

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HON. JULES ALLARD, MINISTER OF LANDS AND FORESTS, QUEBEC,

who has given excellent support to the forest protection cause. By the formation of the Laurentian Forest Protective Association, Quebec has now about 75,000 square miles of its best timber under modern systems of fire patrol.

# *Forests Give B.C. Treasury Over 2 Millions*

Increases in the value of the natural products of the Province produced last year were shown in optimistic reports submitted in Legislature of British Columbia by Premier Brewster in the course of his budget speech. These reports showed the following most satisfactory results:

| | 1916 | 1915. |
|---|---|---|
| Forest | $35,528,000 | $29,150,000 |
| Mines | 42,300,000 | 33,000,000 |
| Fisheries | 14,538,320 | 11,515,086 |
| Agriculture | 32,259,157 | 31,127,801 |

The estimated value of production in the forest industries was $35,528,000, an increase of more than $6,000,000 over the total for the previous year, and greater than for 1914 or 1913. The production of shingles and boxes has shown a noticeable increase.

Better prices and increased quantity of demand have produced a noticeabe revival in the lumbering industry. As against this, shortage of labor, difficulty in securing material such as wire rope, car shortages, and increased cost of production due to general rise in prices of commodities have exerted a considerable effect in preventing development which would otherwise have taken place. In spite of this the total quantity of timber scaled for the year, 1,280,000,000 feet, shows a twenty-five per cent increase over that of the previous year, this increase being general throughout all districts.

The export lumber trade was severely handicapped by the scarcity of tonnage throughout the year, and the quantity shipped overseas was consequently reduced from 58,000,000 feet in 1915 to 44,000,000 feet in 1916. Placed as she is, British Columbia will have every opportunity of doing an important export trade when the tonnage situation is re-established. Such trade was particularly desirable as a stabilizing influence, so that the Coast industry may be less dependent upon the Canadian Prairie market. For the past year, however, the Prairie demand has been most satisfactory, while shipments to Eastern Canada were double those of the year before. Persistent effort is made by the Provincial Government to advertise the merits of British Columbia forest products and to assist manufacturers who are entering new markets.

Including nearly $180,000 from the taxation derived from the crown grant timber lands, the Province drew from forest sources in 1916 a revenue of $2,000,000 which is slightly in excess of the amount for 1915. For the coming fiscal year the direct forest revenue, apart from such taxation, is estimated at $2,300,000, an amount including various royalty arrears which are now being called in. The improved outlook is shown by the fact that last month's forest revenue was the largest since the war began, while the collection for the month from both royalties and timber sales broke all previous records.

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There is, at Ottawa, an independent Society numbering four thousand five hundred members, and known as The Canadian Forestry Association. Its object is the conservation of our forests from preventable waste, and it does so by spreading timely and useful information amongst those interested. I have just received from this Association a little leaflet headed "Who loses?" and am requested to pass on some of the facts contained therein. It may be remembered that this subject was dealt with in these notes about a year ago, when I tried to show how vitally the forest reserves of Canada affected us all, and to point out the necessity of preserving them from unnecessary destruction.—*Melfort, Sask., "Journal"*

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"You are drawing the blood of a future generation in Canada when you misuse the forest resources of the country."—Sir George E. Foster.

# Four Fire Associations Now Blanket Quebec

## Covering 75,000 Square Miles of Province's Best Forest Land, With Great Gains for Timber Saving

Quebec's remarkable development of forest protective associations during the past four years was given a further impetus on April 26th by the formation of the Laurentian Forest Protective Association at Quebec. This latest grouping of limit holders takes in the Lake St. John and Saguenay country where fire losses have been substantial during many years. The area is about 15,000 square miles and extends from west of Lake St. John as far East as Mille Vaches, beyond Tadousac. Hon. R. Turner of Quebec is President and R. L. Seaborne, manager. Organization of the territory commenced at once and with good inspection service, permanent improvements, etc. Mr. Seaborne's area will doubtless take rank with the best patrolled districts in the province.

There are now four associations of limit holders in Quebec: the Ottawa River; St. Maurice; Laurentian; and Southern St. Lawrence; covering approximately 75,000 square miles of the best and most accessible timberlands. The provincial government contributes one, the costs of patrol and fire fighting and leaves the details of management, appointment of rangers, etc. entirely in the hands of the associations. By this means Quebec is securing a degree of forest protection vastly better than under the old system.

The method will probably not be applied in any other province. Ontario has definitely chosen to impose a fire tax on every limit holders and place the responsibility of selection and management of patrol, etc. in the hands of the Provincial Forester, thus allowing to the licensee no authority in fire protection matters. British Columbia also follows the plan of taxing the licensee for fire protection purposes and retaining control of the ranger staff under the Forest Branch.

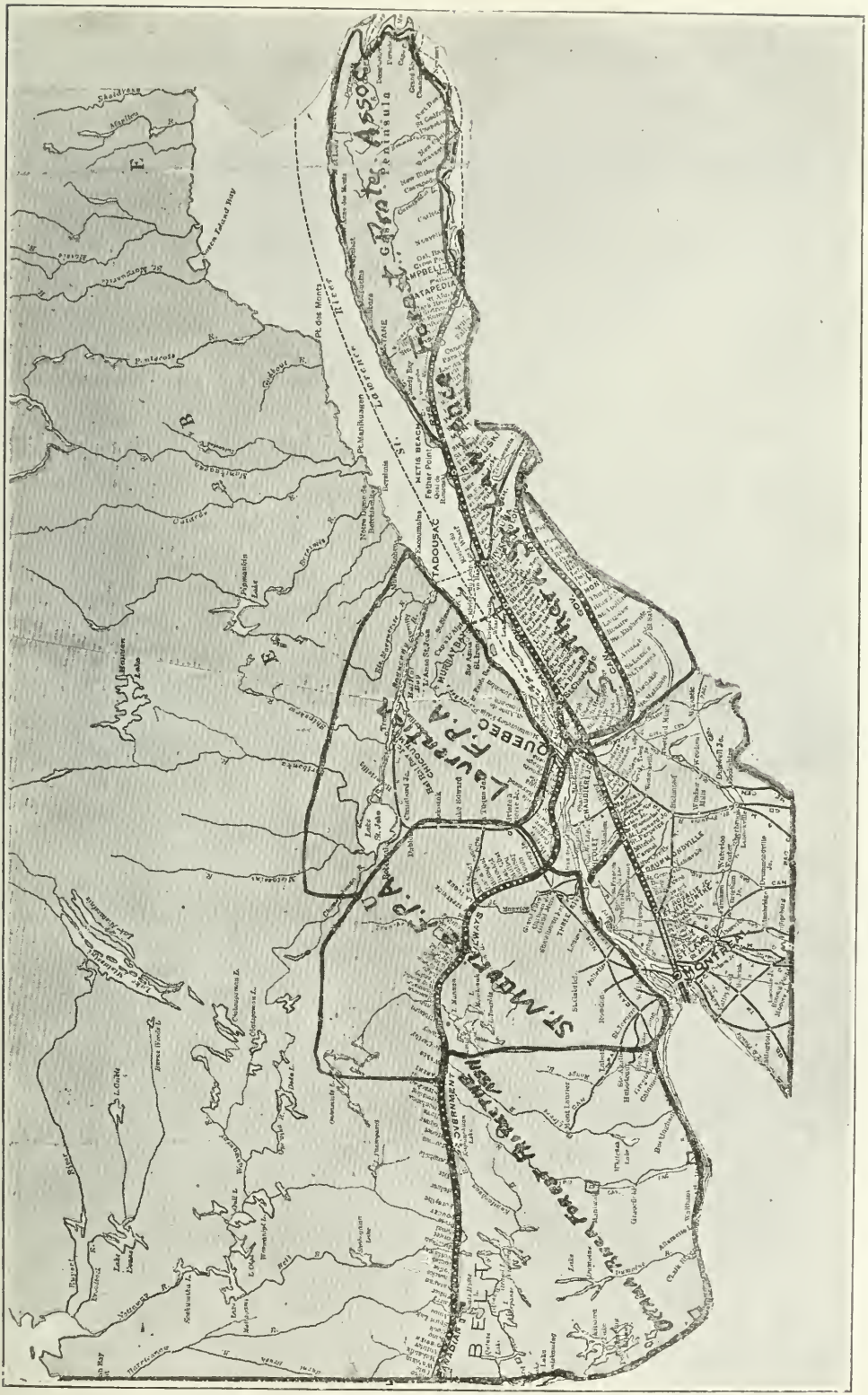
### VALUE OF RUSSIAN STUMPAGE

In normal times before the war, export of Russian lumber amounted to about 5,000,000,000 super feet. This lumber was chiefly cut in government forests. This quantity, compared with the enormous forest stands of Russia, was so small that it gave the Russian treasury an amount of only something like 20,000,000 roubles gross, or 10,000,000 roubles net, which amounts in American currency to about 16 cents per acre.

A study of the possibilities in the lumber trade after the war made by the Russian government, shows a probability of an increase in the demand of Great Britain, France, Holland and Belgium for Russian timber, amounting possibly to about 3,750,000,000 super feet, which would bring the possible total demand for Russian timber to 8,750,000,000 super feet. According to the nature of the northern Russian forests, this figure represented in sawn material, would mean a cutting of about 20,000,000 logs.

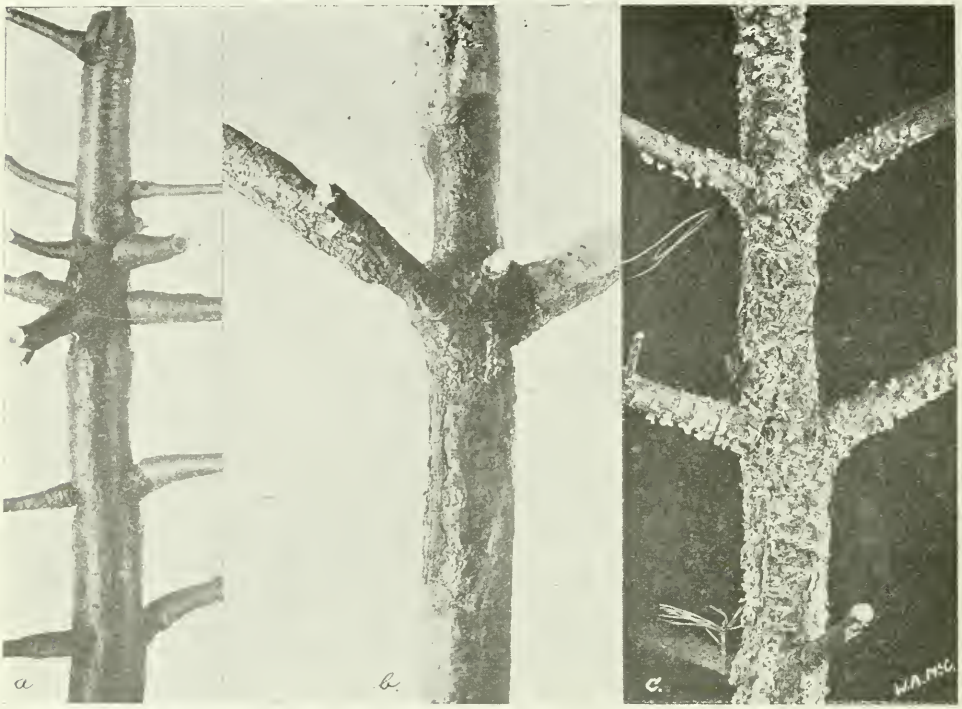
### B. C. WATERSHED DISPUTE

One of the subjects now being popularly discussed by the citizens and press of Vancouver is whether the timber on the Capilano watershed, from which the city's water supply is obtained, can be logged without danger to the water system.




GOVERNMENT RAILWAY MAP OF PROVINCE OF QUEBEC
showing the boundaries of the four Forest Protective Associations; Ottawa River, St. Maurice, Laurentian, and Southern St. Lawrence which include the most valuable timber of the province.

# Warning Re White Pine Disease




WHITE PINE BLISTER RUST. Photos by W. A. McCubbin.
(a) Early stage of white pine blister rust showing typical swelling.
(b) Branch of white pine completely girdled by disease.
(c) Appearance of infected white pine during May and June.

These are days when everyone in or near white pine ought to be scouting for white pine blister.

The following is taken from Dr. Gussow's excellent pamphlet, written for the Canadian Forestry Association. Copies with detailed illustrations will be sent upon request.

"The first and most essential point is to know the disease. If everybody made it his business, when in the woods, every camper, every hunter, every Boy Scout, every lover of our beautiful forests, and, most of all, every forester and wood man, from lumber-jack to owner—to know, recognize, and immediately report, where the disease was observed, and, if in doubt he send a specimen to those who know it, then we may hope to cope with it before it is too late.

The disease is most of all dangerous to the young pine. When it attacks the main stem,—and as many as one hundred separate infections and more have been observed on one tree—and girdles it, which it is sure to do eventually, the tree dies. *During May and June each year*, this disease can be recognized by any one looking for the following symptoms even if we have no training; later on, only experts can determine it. All know the appearance of the fine smooth dark green bark of stem and branches of this white pine. But does everybody know the white pines from other pines? Of course he knows that the white pines have five needles or leaves in a cluster, while others have but two or three. To make sure of this, he need only cut or pull off a cluster

of leaves where they are attached to the branch, and count that little cluster held together at the base by a small sheath—if there are five needles it is almost sure to be a white pine—and even if not, (this disease only attacks five-leaved pines) it should be reported nevertheless.

During May and June, rarely after the middle of June, the disease is most conspicuous on the pine. The formerly smooth dark green bark will be found swollen, puffed up, "blistered," and breaking through the bark will be seen small whitish-orange scale-like bodies of a dusty floury appearance, composed of the spores or seeds of the disease. There may be a few or many at each point of infection. Often times one can see these from a short distance. They may be on any young branch or on the older wood, but they disappear after June, and only the blister remains, though far less pronounced to the casual observer.

Where the scales had been are often small drops of resin, or gum in the popular phrase, though these are not always present,—(or may be present from other causes),—since even mechanical injuries to the bark, such as squirrel bites, etc., will cause gumming. In time, this bark becomes rough and cracked, the disease slowly makes progress up and down, or around the limb or stem, and kills the branch, or the tree if it has girdled the stem; or the wounded area may give rise to another series of spores, but at no other time of the year except May or June, will the spores be seen. In old pines the disease may live for years; young pines will succumb as soon as the main stem has been girdled.

The symptoms should be carefully borne in mind, and always looked for, when one is in the woods in May and June."

Anyone noticing symptoms of the disease on white pine ought to notify at once the Provincial Forester, Toronto, Ont.; Provincial Forester, Quebec; Minister of Lands, Fredericton, N.B.; F. A. Harrison, Deputy Commissioner, Parliament Buildings, Halifax, N.S.; the Dominion Forestry Branch for infections in Manitoba, Saskatchewan and Alberta; the Provincial Forester, Victoria, British Columbia. The white pine area from the western boundary of Ontario to the Pacific is very small, and no contamination there has been reported thus far. The chief white pine sections are in Eastern and Northern Ontario and Western Quebec and through New Brunswick.

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## TREE FALLS, KILLING 11

One of the worst accidents in the history of logging in the Pacific Northwest occurred March 23, at the operation of the North Bank Logging Co., Grays River, Wash., when eight men met instant death and 15 others were injured, three of whom later died. The logging crew was returning to camp for dinner at noon, standing and sitting on two flat cars. An 18-inch hemlock tree, uprooted by the high wind, fell across the head end of the first car, sweeping the men off the cars before the train could be halted. The injured men were hurried to Astoria. Of the men in the hospital on April 10, all seemed sure of recovery with one possible exception.

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## DECAY OF FIR

A detailed investigation of the rate of decay in mature stands of Douglas fir will be undertaken within a few weeks by Dr. E. P. Meinecke, of San Francisco, pathologist assigned to the Forest Service by the Bureau of Pathology. How decay attacks the tree and how it progresses will form an important part of the investigation, which will be carried on in several districts in Washington and Oregon.

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## COMPULSORY PATROL

Some amendments to the Washington forest fire law will probably be offered at the forthcoming session of the legislature. The compulsory patrol system in force in Oregon has worked out very satisfactorily and will probably be adopted by other Pacific Coast states.

# Federal Gov't Assists in Fight Against White Pine Menace

Hon. Martin Burrell, Federal Minister of Agriculture, has decided upon a plan of co-operation with the provinces for checking the white pine disease of blister rust which is bound to prove of utmost advantage.

Representations as to the seriousness of the blister disease in Eastern Canada were made to the Minister by the Canadian Forestry Association, Commission of Conservation, and by pathologists of the Department of Agriculture. The Minister gave the question prompt and thorough consideration and arrived at a decision which every friend of forest conservation in Canada will recognize as practical and praiseworthy.

The Minister will ask Parliament this month to sanction an expenditure, understood to be above $50,000, in order to assist the provinces in locating infections. This involves a great amount of work in scouting, with constant travel, and a large staff of inspectors. Conferences with the Provincial departments of Lands and Forests have resulted in an agreement that the provinces should engage as many men as will be necessary for the task and pay their salaries. The Dominion appropriation will meet the travelling expenses, which makes the division of cost about equal. The responsibility for results and authority in directing the work is left with the Provinces.

Mr. W. A. McCubbin, who has been engaged on pine blister work in the Niagara Peninsula for more than a year will take general supervision of the work on behalf of the Departmentof Agriculture, visiting Ontario, Quebec and New Brunswick.

With this plan in operation, there should be by the Fall a fund of information as to the districts affected by the white pine disease, and such knowledge will be a guide to the provincesand Dominion in future action.

## THE PATRIOT'S VIEWPOINT

Ontario, Feb. 9, 1917.

Canadian Forestry Association:—

Enclosed find our cheque for five dollars, Contributing Membership Fee, to help the spread of information how to preserve our forests and make good our waste. E. D. S.

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Prof. W. N. Millar, of the University of Toronto Forest School has arranged to enter the service of the United States Army of which he is a reservist and will leave Toronto about the end of May.

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Mr. R. L. Seaborne, Manager of the newly formed Laurentian Forest Protective Association, has had valuable experience as an inspector of the St. Maurice Forest Protective Association.

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T. B. Molloy, assistant superintendent of insurance, Winnipeg, has assumed charge of the fire prevention branch and is busily occupied in organizing the municipal officials who will, under the new law, report all conflagrations, with causes, damage, etc., to the department at Winnipeg.

### UNUSUAL PHOTOGRAPHS PURCHASED

**Rangers and others having unusual photographs of any subject identified with the forest are asked to submit them for examination to the Canadian Forestry Journal, 119 Booth Building. For those available, one dollar each will be paid. Pictures must be clear, sharp, and of a minimum size of 3¼ by 4¼.**

# Strange Ways of Using Wood Pulp

## Paper Lamps, Chimneys, Paper Umbrellas, Boots, Boats, Wheels —a Few New Uses for the Tree

There are probably no commodities in established use which have so greatly extended their sphere of utility as wood-pulp fibres and paper, and within recent years the novel uses to which they have been, and are still being placed, have enormously increased in number. Mr. Gladstone is our authority for the statement that even 60 years ago the uses of paper were varied and numerous. In the speech to which we have just referred he stated that he had a list of 69 trades in which it was used. "For example," he said, "it is largely used by anatomical machinists to make artificial limbs; by telescope makers, by boot and shoe makers, by cap manufacturers, for the foundation of caps and hats, forming all the peaks and many of the tops which look like leather; by china and porcelain manufacturers; by doll makers, and by shipbuilders; and again in making optical instruments, in pictures and looking-glasses, in portmanteaus, in Sheffield goods and teapots." "One manufacturer writes," Mr. Gladstone continued, "that he has made panels for doors from paper, and above all he looks forward to making carriages of paper when the duty shall have been taken off. Another manufacturer, who is asked into what combinations paper may be made to enter writes to me: 'Who can fix the limit to ingenious combinations when we see India rubber being made into strong and durable combs and other articles of that sort? Only this morning I was informed that paper pipes are actually made prepared with bitumen and capable of standing a pressure of 300 pounds of water to the inch.'" This was nearly two generations ago, and during the intervening years it has become increasingly recognized that not only may paper be found useful for other than printing, writing, and packing purposes, but that wood-pulp is capable of being advantageously used in the manufacture of other goods than paper and cardboard. Pulp and paper, says the British Paper Trade Journal, have furnished a rich field for exploitation, and in altogether new spheres of usefulness have arrived at a stage which may be said to guarantee their permanent serviceability. Nowadays, the public are familiar with artificial silk, coarse cloth, and fabrics closely resembling mercerized cotton produced from wood-pulp fibres, and it is stating nothing new to say that ties and waist-coats are being made from pulp and paper. As a matter of fact, both pulp and paper can now be formed into solid substances capable of competing with wood or iron in point of durability and elasticity, and for some years past, treated by special methods, they have been converted into such articles as paper bottles, figures, ornaments, furniture, etc. Waterproof coverings for walls and ceilings, parchment slates, flanges and manhole rings, paper wheels, roofing and boats, paper barrels, gas pipes, boxes and horse-shoes are also no longer novelties. Probably one of the most valuable by-products of the manufacture of sulphite pulp is that of spirit from the waste, and particularly in Sweden, the distillation of alcohol from cellulose bids fair to become an industry of considerable importance. Then it is but a few years since the chairman of the tanning section of the Toronto Board of Trade declared that paper inventions had gradually entered into competition with leather, and that hides had advanced in price to such a degree that the output had dropped 50 per cent. in Canada, a condition of affairs which had compelled the use

of such substitutes as fabrics and paper.

*Building Board*

Paper as an article for building purposes is well known in Scandinavia and Japan. In the latter country not long ago a country house was entirely constructed of paper, and in Scandinavia a great quantity of wood pasteboard is used as the lining for wall papers, while in the United States a heavy paper board for use in building operations is also made from waste sugar, sugar cane and corn stalks. In a small mill at Koyasa, Kanagawa (Japan), waterproof paper is now manufactured for shirtmaking.

Paper string and twine has within recent years come to be recognized as a valuable substitute for the ordinary variety. Paper string is now being made of such stoutness that it is suitable for tying up parcels of quite a fair size, and its manufacture is now being carried out in this country. Twine has been produced from paper in Germany for some years; the cord is spun from strips of brown or white creped thin cellulose paper, and the few mills making it are said to be unable to meet the demand.

*Paper Umbrellas*

Making artificial flowers from paper is not a new idea, but it is probably not so well known that they are now being made of paper rendered noninflammable by the moderate use of asbestine. It may also be recalled that a demonstration given in Toronto a short time ago samples of sections of chandeliers, lamp brackets, etc., made from sulphite pulp, which had been subjected to a very high pressure and then blown into metal moulds were shown, while paper lamp wicks are said to be now replacing cotton wicks throughout Austria-Hungary. The Japanese sunshade is, of course, quite a familiar object, but the collapsible and stormproof paper umbrella, devised for use in emergencies by an ingenious American, has not yet obtained wide favour. Tests, however, are said to have shown that with ordinary care the cover will last for months in heavy rain and strong winds.

*Paper Lamp Chimney*

Twisted or hardened paper is also being extensively employed at Sheboygan, U.S.A., in the manufacture of paper furniture, and bags and trunks of compressed paper are perhaps somewhat better known than the paper jackets for sausages, which have been introduced on the other side of the Atlantic. Vulcanized fibre, which is simply paper treated with zinc chloride, is also being extensively used in the manufacture of tool handles, bobbins, tubes, etc., and paper binder twine, paper window shades, paper matting and paper floor coverings, the latter generally made with an admixture of cotton, are now widely used. Paper insulators are, of course, in comparatively common use, but it must be admitted that a paper chimney, of which we have heard, is something of a novelty. Paper cartwheels and paper boats are, however, no longer curiosities, though it is stated that the paper boat is, indeed, a very substantial and serviceable craft.

The great war has also developed new uses for paper and pulp. It is now well known that Germany is using chemical pulp in place of cotton as a basis for the production of high explosives, and a German military surgeon goes as far as to say that not only cellulose wadding, but mechanical wood-pulp, wood flour, wood wool and wood felt have done good service as substitutes for cotton in making dressings, while another authority states that for wound secretions, filter and blotting paper serves the purpose admirably. Cellulose wadding is used in dozens of forms as a substitute for cotton, and its employment is stated to be even more advantageous when loosely cotton woven cotton wicks are substituted for closely woven wicks, particularly in spirit and petroleum lamps. There have also been stories of paper boots and paper socks worn by soldiers of the European battlefields, and it is reported that paper beds, with paper sheets and pillow-cases, are now being used in Germany by the poor, the mattresses being made of strong sheets of paper pasted together and filled with dry leaves of beech and

A WINTER FOREST SURVEY PARTY IN NORTHERN SASKATCHEWAN.

oak trees. The paper used is toughened by a special process which prevents easy tearing. In this connection, it may be mentioned that recently in Copenhagen a new German textile, in which paper is spun with about 20 per cent. of cotton, was exhibited. From this, paper underclothing, sheets, jerseys, bandages and horse blankets were made, but it is admitted that the cost of production is too high to allow of its competing with cotton and woollen cloth in normal times. Probably the largest use of spun paper in the United States lies in the manufacture of fibre rugs, in the production of which no fewer than twenty-five factories are engaged, one of them turning out something like twenty-five tons of rugs daily. Most of these rugs are made made entirely of paper, but in some instances an admixture of cotton or wool is used. The possibilities for sulphite pulp in the manufacture of toys was a topic upon which Sir George Foster recently dilated at a manufacturers' convention in Toronto, and at a school near Southport, waste paper, after being pounded and kneaded, is now being used in place of clay for modelling purposes.

Altogether there seems to be no limit to the potential uses of either pulp or paper, and there is no doubt that in the near future considerable developments in this direction will have to be recorded.

## NEW FORESTRY FIRM

C. A. Lyford and H. E. Brinckerhoff have formed a partnership under the name of Clark & Lyford for the practice of Forest Engineering, with headquarters at 15 E. 40th St., New York. They will act as Eastern Agents for Clark & Lyford, Ltd. of Vancouver.

## THE NEW ASSOCIATIONS

In the formation of the Southern St. Lawrence Forest Protective Association, the majority of the limit holders and owners of free-hold lands, from the county line between Dorchester and Bellechasse right down to the Gaspe peninsula will have one President, and one Secretary-Treasurer, but will divide the territory in two sections, the Eastern and the Western, each Section to have a vice-president and Manager chosen by a board of five Directors; the whole Board of ten directors will have charge of all matters pertaining to the whole Association, but each Section will be independent so far as funds and administration are concerned.

## Appointing Rangers on Personal Merit

The long overdue task of subduing the patronage evil in appointments to the Civil Service has been commenced in British Columbia. The Forest Service is the first to benefit. Following protests by the lumbermen's organizations, Canadian Forestry Association, Commission of Conservation and others, against further toleration of the patronage plan in forest protection, the Brewster Government inaugurated a scheme of two examining boards, having jurisdiction over appointment of rangers in the Coast and the Mountain sections. The original proposal was that the lumbermen should control these boards, but this was modified to retain responsibility in the hands of the Government who have three members on each body of five. Already the plan has been set in motion so as to apply to ranger appointments in the present fire season. Written and oral examinations are required and while the time allowed to the British Columbia Forest Branch for preparation was embarrassingly brief, the intention of the Government is being thoroughly carried out. Applicants were notified of the examination dates and in some instances more than one hundred men appeared to stand their ordeal. Sixty per cent. was allowed for experience. Upon the decisions of the examiners all ranger appointments will be made hereafter. As a substitute for the vicious system of appointment by stealth, known as the patronage plan, the British Columbia arrangement is a valuable step forward and may be the means of leading other provinces and the Federal Governments to try the Civil Service idea on their field appointments.

## Forest Survey Made With Camera

Unusual methods were adopted in making a survey recently of the Columbia National Forest in the state of Washington, which comprises an area of over 1,000 square miles, mostly rough, hilly, and heavily timbered land, difficult and expensive to survey in the ordinary manner. With the aid of a photographic outfit, however, a satisfactory survey was made by one member of the Forest Service, who covered 93 square miles a month on an average during the progress of the field work. This has occupied several open seasons, the winters being spent in working up the field notes into accurate maps showing the contours and all streams in the forest. The surveyor was accompanied by one assistant and packer, and traveled on horseback, with two pack animals. Observations and photographs were made from definite "stations" when the weather permitted, about 15 such stations being occupied each month. Four exposures were usually made with the camera at each station, each plate developed taking in the view within an angle of 65 degrees. Each photograph was marked on its margin with a horizon line by which elevations and depressions were subsequently measured for map making, and it was found that the contours drawn by this method were surprisingly correct, usually coming within 50 feet or so of actual elevations. About 50 square miles were mapped each month when field work was impossible the scale used being 1 in. to the mile. The total cost for field and office work was approximately $4.60 a square mile, which is regarded as low, compared with the cost of ordinary surveys.

# Impressions from India

The first shock to a Canadian travelling in India is the wooded state of the country. One expects that hundreds of millions of people warring through thousands of years and finally under a century of peace crowding agriculturally 300 to 600 to the square mile would have produced a denuded land. Such is not the case —except in the arid Indus valley— the whole land, viewed from a railway carriage, appears forested, and even the Ganges plain with its agricultural half thousand to the square mile is so dotted with trees as to appear at a distance of less than a mile an unbroken wall of forest. The temperament which leaves trees to grow, in groves, rows and scattered throughout the most valuable fields without even the protection of the fence row, which saves a few trees in America, must have been an important factor in leaving any forests for the British to administer in India.

The forest area of British India now stands at about 336,000 square miles, or 31.1 per cent. of the total land area. Though the forest cannot all be considered as productive timber land, or even as wooded land, as will be explained later, the proportion of actual forest must to a Westerner appear very large, especially when the age, history and population of the country are considered.

The large proportionate area of forest is explained by three or four conditions wherein India differs fundamentally from American conditions, which act as brakes on forest destruction in India.

Recent Canadian experience to the contrary, the Indian is not an emigrant. The strongest human tendency in Canada and the United States has been to move west along the parallels of latitude and destroy forest. The native North American has not waited either for pressure of population upon the land or for a market for the timber in the virgin Western forests to furnish the stimulus for the Western movement of population. The Indian, the direct antithesis of this man, even when the agricultural population has reached 600 to the square mile; has not felt impelled to leave his ancestral paddy field and move a few hundred miles to another part of his native province or to another province of India, even though bountiful paddy fields have already been proved there, settled government established and railroads laid down for easy transport.

The Indian will assuredly cut down the forest bordering his field and village if allowed, but he will not migrate to attack a new forest area. Nearly every province contains a fair proportion of forest, some if it seemingly on good agricultural land and only a hundred miles or so from districts so densely populated that to use Kipling's description of Canton you feel that if you knocked a corner off a house it would bleed. Other provinces, rich beyond dreams, in the capacity for growth of myriad crops, such as Assam and Burma, lying in the direct line between the hordes of China and the swarms of India to this day cry aloud for population and all through the past have suffered little or no forest destruction.

A large proportion of the forest wealth of India is in these two provinces. If they are omitted the forest in India sinks to 21 per cent of the land area. One should be permitted to dream a moment what would be the situation in North America today if we had possessed only a little of the Indian's characteristics of pausing to make each acre fertile before passing on to denude another. We should have been still somewhere East of the Appalachians and the beaver would not yet have been driven out of Canadian rivers to take refuge in the folds of the flag.

H. R. MacMILLAN,

(Former Chief Forester of British Columbia.)

# PRESENT STATE OF FORESTS IN PRAIRIE PROVINCES

A most interesting and informative estimate of forest conditions has been furnished by the Dominion Forestry Branch at the request of the Canadian Forestry Journal. It deals with the results of examinations by Forestry Branch reconnaissance parties of about 100,000 square miles north of the prairies in Manitoba, Saskatchewan and Alberta. On this area, which is accepted as typical of the bulk of the tree-covered lands (the complete survey of which will be completed in about two years)

about 6 per cent. is grassland or prairie,

about 3 per cent. is water,

about 23 per cent. is muskeg or slough,

about 55 per cent. is covered with more or less good reproduction verging in size from seedlings to trees 8 inches in diameter, B. H. This includes also recent burns where the reproduction may as yet be very poor or altogether lacking.

About 13 per cent. of the area is covered with timber of merchantable size, 8 inches or more.

This estimate is at once a tragic testimony to past neglect and a reminder that only by resolute conservation policies beginning with exclusion of fire and on through replanting to a scientific plan of utilizing mature timber will the timber resources of the prairie provinces prove equal to the requirements of future population. If, as claimed, the future of Canada depends upon heavy immigration, the hope of immigration depends not upon bare land merely, not upon wider markets merely, but upon holding down the costs of production, in which the cost of lumber and fuel, fence posts and other wood supplies bear such a substantial part. As the cost of wooden pit props affects the price of coal, or the cost of barrels affects the selling price of fish, so the thousand-and-one products of the forest that enter into a modern farming plant will retard or send up the production cost of wheat and live stock according as the storehouse of the provincial forests is in a flourishing or depleted condition.

The forests of Alberta are primarily for Alberta's use. So with Saskatchewan and Manitoba. Each province gets all the dividends of conservation, by whomsoever applied.

## THRIFT IN FOREST FIRES

There are estimated to be 10,000 forest fires in Canada every year of all sizes and descriptions. Nine-tenths are set by human hands, and the damage runs from four to ten millions of dollars, not counting damage to soil, to the value of watershed areas and many other factors.

"Thrift in forest fires" is a new movement which the Canadian Forestry Association has started amongst the guides, and campers and sportsmen of Canada with a view to cutting down the country's timber losses in 1917. As is well known, the present-day causes of forest fires are not the railways as much as the settlers, campers, hunters and fishermen. Thoughtlessness in respect to camp fires, the throwing away of lighted tobacco, matches, etc., has caused some of the worst conflagrations in history. During the months of May and June, before the fire season is well under way this year, thousands of out-doors men are being asked by the co-operation of the newspaper publishers of Canada to make 1917 a year of thrift in the forest.

# Education by Public Lectures

The sets of fifty lantern slides and lecture manuscript, sent out without charge by the Canadian Forestry Association to clergymen, teachers, and others in a position to gather an audience, have been extensively used during the past four months.

As an example of the manner in which these lecture sets are employed, the following appeared in the Keewatin, Ont. "Enterprise" of April 21: "An interesting lecture on lumbering and forest protection, illustrated by lantern slides was given in the Oddfellows' Hall on Monday evening under the auspices of the Canadian Forestry Association. The Hall was well filled. Messrs. A. G. Holmes and D. McLeod (Manager of the Keewatin Lumber Co.) gave interesting addresses pointing out the great importance of the lumbering industry in Canada and the necessity of protecting the forests for future supply."

A note from a Keewatin correspondent adds: "There were about 150 children present and an equal number of adults. Each of those present was presented with a copy of your booklet, "Your Enemy's Photograph" and also a copy of the booklet for campers. The people appeared to be very interested in the meeting and we are satisfied that good results will follow."

Another of these lectures was given at Knowlton, Quebec, by Rev. Canon Carmichael before a very large audience, Hon. Sydney Fisher, President of the Canadian Forestry Association being chairman.

The call for these lecture sets from all parts of Canada is beyond the Association's financial ability to meet as it should be met.

As far as the revenues will allow, however, this part of the propagandist work is making headway. At least ten lecture outfits could be employed the greater part of the year, by designing each lecture to apply especially to the Maritime Provinces, Quebec, Ontario, and three prairie provinces, and British Columbia and operating each from a provincial headquarters.

# Developing the Forests of Alaska

Discussing the opportunities for the development of the forests of Alaska for paper manufacture, Henry E. Surface, engineer of the United States Forest Service estimates that an initial investment of $2,000,000 for a 75 ton mill would be necessary.

"Probably the most important obstacles holding up serious consideration of Alaskan pulp and paper enterprises by parties well able to finance them are the undeveloped conditions generally existing and especially the lack of detailed information on specific local resources and facilities." Continuing the report says:

"So far as legislation and the regulations of government departments are concerned, there are no obstacles to the development of pulp and paper enterprises and the use therein of the necessary sites, timber, water powers, and other natural resources of the public lands; in fact the terms of government lease, permit, sale and title may be considered encouraging even for pioneer conditions and capital may be assured of ample security in these regards." Taking up the question of Timber on the Tongass Forest, Mr. Surface says:

"The present stand of merchant-

able timber on the Tongass Forest is estimated at 70 billion feet and as only the best of the spruce, cedar, cypress and possibly a little of the very best hemlock, is now considered as saw timber, it is evident that for pulp purposes which can include all of the hemlock as well as the spruce in sizes and grades not at present called merchantable, the estimate is very conservative. The area of the stand is estimated at 8,000,000 acres with an average stand of 9,000 feet per acre. Assuming new growth at the very low rate of 25 by 30 feet b.m. per average acre per year, the reproduction alone would perpetually support newspring paper mills of 1,000 tons combined output per day or five mills the size of the big Powell River concern in British Columbia." Taking up the question of the accessibility of the timber, the report continues:

"At present hand logging is much in vogue, but logging with machinery is gradually coming in and would be used on all the proposed pulp chances. The Tongass Forest has about 12,000 miles of timbered shoreline and the bulk of the timber can be easily brought to the water and rafted or boomed for towing to its destination through the well-protected waters. Present logging costs from stump to boom, even under the more efficient operations, will generally fall between $4 and $5 per 1,000 being tolerably uniform for all accessible areas within a mile of the shore. Towing is very inexpensive, being about one per cent per 1,000 feet b.m. per mile, except for the shorter hauls. For these reasons it is not essential that a pulp mill should be located on the area from which it gets its timber.

## U. S. SEEKING OUR WOOD

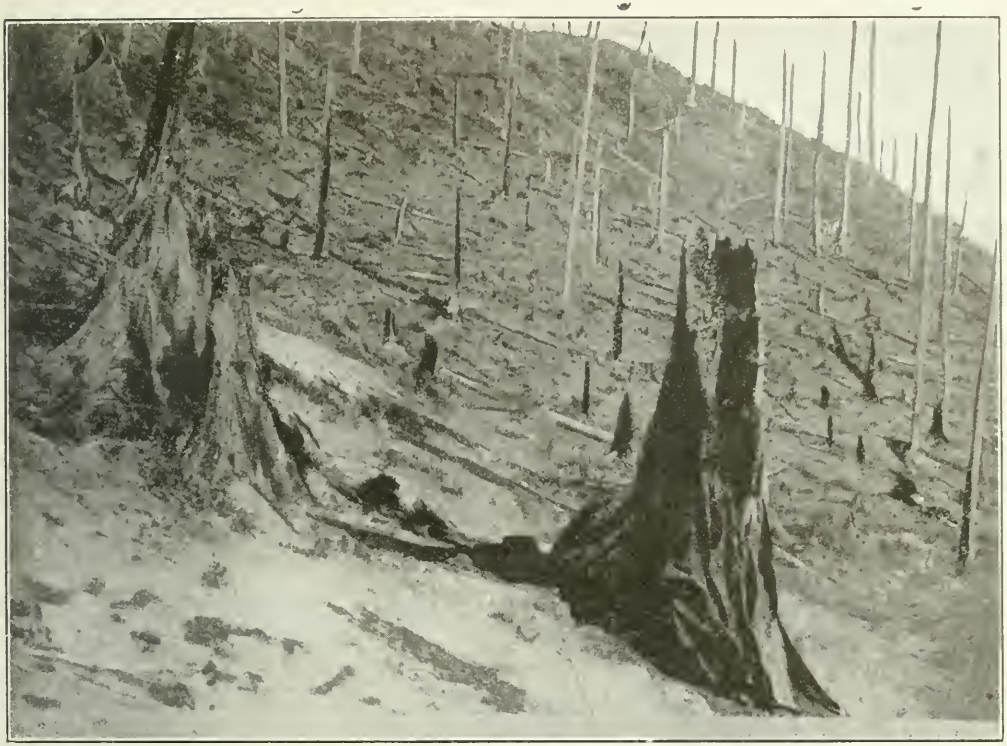
Mr. K. C. Clark, of Oldtown, Me., in a recent interview with the St. John, N. B., "Telegraph," stated that United States lumber firms in the east are reaching out more and more into Canada for material, and that within another five or ten years almost all the large lumber mills in Maine will have been converted into pulpwood and pulp mills.

## TIMBER FOR SHIPBUILDING

Every local freight train on the N. T. R. is carrying east in carload lots spars and other special timbers needed in the construction of wooden ships, an industry which is experiencing a great revival at various points in the Maritime Provinces, says the Times of Moncton, N. B. Some of the shipments consist of heavy timbers to be used for masts and spars of wooden vessels. There is also considerable shipment of planking and wooden ribs for the vessels. The most curious part of the shipments, however, are the wooden "knees" which are really the crooked roots of trees, sawed into sizes suitable to shipbuilding purposes. These "knees" can be made from ordinary timber, but builders prefer the natural bend of the roots, which are very fibrous and tough. Quite an important part of present day lumbering operations is the digging up and cutting out of crooked roots suitable for this purpose. The small knees are used for bracing stem and stern posts and similar parts exposed to heavy strains.

## SUSPEND FOREST SCHOOL PLANS FOR PRESENT

The task of building up revenues to meet expenditures has rendered necessary the postponement of the plan for commencing a Forest School in connection with University of British Columbia as well as the proposed scheme for a Forest Products Laboratories to assist the British Columbia timber industry in many of its special problems. New tax adjustments are expected to overtake the deficit in current expenditures during the next twelve months and it is understood that no time will be lost in giving effect to the plan for the Forest school and Laboratories at Vancouver.



SOME FORE-HANDED THRIFT WOULD HAVE HELPED HERE

# Building a Camp Fire

As this issue of the Journal will find hundreds of our readers planning summer vacations in the woods, the following article is reprinted from an earlier issue in order that all may take advantage of the hints on building a camp fire.

Camp stoves should be taken whenever they can be transported. They are safer than open fires, more convenient, require less fuel, and do not blacken the cooking utensils. Collapsible sheetiron stoves may be obtained.

In the absence of a stove an open fire must be built. A safe and serviceable fireplace can be made of rocks placed in a small circle so as to support the utensils. Where rocks are not obtainable, poles may be used.

For permanent camps it pays to build a stone fireplace. A piece of sheet iron will prevent the blackening of the pans and makes a better draft.

For temporary camps the fire should be built as follows:

Dig a hole about a foot deep and about three or four feet in diameter. Shovel away the side toward the wind. Lay green poles across the hole to support the pots and pans, and build the fire underneath.

Fire irons are often a great convenience. A piece of three-eighths-inch round iron four feet long is bent at tight angles a foot from each end and the ends are sharpened. Two of these irons are placed side by side, the ends are driven into the ground and the fire kindled beneath them. Instead of being made in one piece, the pegs and cross-bars may be connected by rings in the ends. They will then fold and be easier to pack.

### *Small Fire is Best*

Camp fires should never be larger than necessary, and the utmost care

should be taken to prevent sparks from being carried into the neighboring forest. Clear away the litter for a considerable space about the fire. And be sure to *put the fire out* before you leave it.

A shovel is nearly as important a tool as an axe in camping. Do not count on finding one along the way, but put one in your outfit.

During wet weather look for kindling in burned pine, or in pine knots. The under side of a leaning tree will usually contain dry material. Dead branches, that have not yet fallen are drier than those on the ground. Bark from fir snags is excellent fuel.

Where matches are scarce or when the weather is stormy, first light a candle and kindle your fire from that.

Hints on fire protection are always timely and fit particularly well with these instructions about camp fires.

The first thing is prevention. Bear in mind the Six Rules. Be particularly careful with camp fire, matches and tobacco, since carelessness with these is punishable by law.

Scrape all inflammable material from around the fire before lighting it. Make a fireplace either by digging a hole or by piling up rocks. The fire will then not only be safer but will draw better.

Before leaving camp see that the last spark is extinguished. Pour water on the embers and then cover them with earth.

Don't make your fire too large. Large fires are not as convenient to cook by as small ones and are more trouble to put out.

*To Overcome Fire*

If you discover a fire, go to it at once and put it out if you can. A small fire can be put out easily by throwing handfuls of earth or sand at the base of the flame. The flames may also be beaten down with sacks or with branches, but care must be taken not to scatter the fire.

If the fire is spreading too rapidly to be attacked directly, cut and scrape a trail some distance ahead of it. Do not back-fire; this is work for an experienced man. If a fire is serious enough to require this treatment, the work should be left to a ranger.

The best tools for fire fighting are the shovel, axe, and hoe or rake. In open pine forest very little axe work will be required. Shovel or rake a trail through the needles down to mineral soil, and guard the trail.

To stop a fire burning in brush the trail must first be cut with the axe and then scraped. The brush should be thrown to the side away from the fire. The litter may be scraped toward the fire.

Pick a route for the fire trail that will avoid brush patches if possible. The crest of a ridge is an excellent location, since the fire naturally checks at the top.

**See that a fire is cold before you leave it.**

Report all fires to the nearest forest ranger, or railway agent, or settlement

Do not suppose that because a fire is merely burning in apparently worthless brush it is therefore doing no damage. Such fires are often the most serious.

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**Postscript: There are about 10,000 forest fires in Canada every year, over 1,300 a month between snow and snow.**
**1917 IS A YEAR OF THRIFT.**
**LET'S CUT THAT 10,000 FIRES IN HALF!**

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## SURVEY FOR LAURENTIDE CO.

Dr. Howe, of the University of Toronto, with two technical assistants, will commence for the Commission of Conservation and in cooperation with the Laurentide Company, Limited, a survey of the cut-over pulpwood lands. This survey will determine the amount of wood left after logging, the reproduction, rate of growth and probable yield of timber after a certain number of years, and will make recommendations as to improved methods of cutting.

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## ANOTHER COMPANY TO PLANT

The Belgo-Canadian Pulp and Paper Company, Limited, of Shawenegan Falls, Quebec, has decided to commence planting trees on its holdings, making the third large paper company to undertake such reforestation work.

# Shelter Belts and Farm Crops

In order that soil may do its best for the average farm crop it is necessary that it contain about half of the water that it is possible for it to hold. When saturated a heavy clay soil will hold 40 per cent. of water, and it is generally agreed that 18 per cent. of water in soil is most favorable to plant growth. A practical farmer needs no measure or scales to tell himwhen his land is in fit condition for sowing, but many a one fails to attach sufficient importance to the necessity for this fit condition, and as a result much good grain and other seed is sown in mud that allowed it no chance of developing into satisfactory crop.

*Managing Moisture*

The season of 1916 was proof of the fact that in the matter of commanding moisture supply, two points have to be considered, namely, dispersion and retention of moisture. To attain both ends, drainage and mulching have to be practiced, and it is a question if anything more or better than drainage can be made use of or the removal of excess moisture from the soil, but in the matter of retaining moisture or supplying it there are other means than cultivation of the top soil, possible of being used: irrigation is one of these, and another not very often considered, is the provision of tree belts that will help to retain a certain amount of moisture in the atmosphere and so affect the soil beneficially in times of drought.

# The Fire Pump in Timber Guarding

An impressive test of the improved design of fire pump on which Mr. Harry Johnson, Fire Inspector, Board of Railway Commissioners, has done such valuable work, was made at Ottawa on May 9th before interested spectators.

The factor of portability has bulked largest in Mr. Johnson's experiments and, of course, has been the chief barrier to the use of any of the existing types of pumps for extinguishing fires in the forest. Last year a most practical experiment was tried by the St. Maurice Forest Protective Association at La Tuque, P.Q., where one of the pumps did splendid service and saved its cost on the single occasion.

This year's design couples the engine and pump direct, the carburetor has been made more get-at-able, and the general efficiency of the engine improved. The test was conducted by placing the pump five feet above the level of the Ottawa River and running 1500 feet of hose on an eighty-two foot rise to a point beneath the Sparks Street bridge. With such severe friction as was offered by the length of hose and with the handicap of the rise, the engine delivered 20 imperial gallons a minute at the nozzle, throwing a stream that approximated thirty to forty feet. The engine and pump weigh 132 pounds and are being adopted in considerable numbers by the Ontario forest service and by private associations in Quebec.

## LAVAL MEN APPOINTED

In the new Southern St. Lawrence Forest Protective Association, Mr. B. Guerin is District Fire Inspector of the Western Division with headquarters at Quebec, while Mr. J. D. Brule is Inspector of the Eastern Division with headquarters at Campbellton, New Brunswick. Both officials are graduates of the Laval Forest School where they made a record of distinction.

# New Methods of Forest Operating

Lecturing recently before the Natural History Society of Montreal Mr. Gustave C. Piche, Chief Forester of Quebec, gave some most interesting information as to the necessity for changed methods in order to secure the perpetuation of Canada's present forest values.

Mr. Piche estimated that Canada held about 414 million acres of forests, but this supply, he believed, would not last beyond fifty years unless precautions were taken. The methods to be followed for forest preservation were as follows:—

Systematic cutting, based on the maturing growth of the forests.

Proper prevention of forest fires.

Preparation of proper forest reserves.

Reforestation of lands destroyed by fire, or denuded of forests through other means.

Co-operation of all interested for the protection of the forests, and the employment of forestry engineers to deal with the matter of forests.

It was impossible to present an accurate idea of the forests of Canada, in view of the lack of knowledge of some sections of the country, said the speaker. Mr. Piche said that one-third of the country was practically bare of trees. This was the polar section, covered by the Arctic glacial period.

Mr. Piche then dealt with the forests that did exist, speaking of the various sections in the two big classes of forestry that belonged to Canada. He dealt with various types, those in this province, and on the Pacific Coast, remarking that the forests of the Pacific Coast were the richest in the world, being a continuation of the great forests of Oregon and Washington States. He touched on the type of trees to be met with in that region. Mr. Piche then dealt with the forest richness of the provinces in detail.

Mr. Piche, in summing up, said that it had been judged best to reduce the estimate of the forest wealth of the country to 414 millions of acres, but this meant good producing timber. However abundant this forest wealth might seem, it was necessary to take energetic measures as to preservation, and to make an inventory of forest contents with a view to maintaining the supply.

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Canada has not one tree too many for present and future needs. We own just one quarter of the timber possessed by the United States. Since pioneer days, the Fire Fiend has robbed us of two-thirds of our original forest inheritance. On what remains the most careful economy will be necessary to meet the increasing requirements of the population. Forest protection, then, is just a matter of good citizenship.

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## SHANTYMEN'S ASSOCIATION

The ninth annual meeting of the Shantymen's Christian Association was held at Toronto on April 16. The report for the year showed that the work of the association had reached 30,174 men during 1916, in the Prince Albert district of Saskatchewan, the Rainy River district of Manitoba, from Nipigon east to Sudbury, and from Sudbury to North Bay, with North Bay as the centre. During the year ended March 31, 1917, visits were paid to 685 camps, as compared with 355 in the previous year. The staff of the association tramped on foot in order to carry on this work, 1,775 miles. During the year they employed thirteen missionaries, as compared with eleven in the previous year. The subscriptions and collections received during the year amounted to $5,178, as composed with $3,313 in 1916. Officers for 1917 were chosen as follows: President, H. B. Gordon; vice-president, J. J. Gartshore; secretary-treasurer, R. D. Richardson; superin-

tendent, William Henderson; directors: J. McClelland, John Firstbrook, Dr. W. H. Howitt, and Sidney T. Smith. The officers and directors of the general council comprise fourteen members from Winnipeg, Hamilton, Port Arthur, Ottawa, Montreal, and Toronto.

## INTERNATIONAL BIRD TREATY

By the recent treaty relating to migratory birds, negotiated between the United States and Canada and ratified by both governments, more than one thousand species and subspecies of the most valuable birds of North America will be protected from the Gulf of Mexico to the Arctic Ocean.

All that remains to complete the work of migratory bird conservation in this country is the passage by Congress of an enabling act to carry out the provisions of the treaty effectively. The efforts of those men who have been responsible for this far-sighted, international agreement are deserving of country-wide recognition.

—"*Our Dumb Animals*"

## FOREST GUARDING IN B. C.

(Vancouver Sun).

All who have an interest in the welfare of the province will be glad to learn that more attention is to be given by the provincial government to forest protection. Though money is scarce it must be found for forest conservation. Canada lost by forest fires in 1916 $9,000,000, more than six times as much as has been spent on forest protection work. Most of these fires were preventable. In British Columbia, owing to the efficiency of the forest protection service, and to somewhat more favorable weather conditions, the number of fires last year was only about half that of the previous year. Yet the loss was very considerable and a better protection service would have meant fewer fires and less fire loss. Money devoted to the extension of forest protection is well spent indeed.

The presence of a protective force, the construction of trails, and lookout towers connected to headquarters by telephone, are merely for the purpose of dealing efficiently with the fires that break out. A more important measure is to reduce the quantity of dry material on the forest floor, reducing the danger of fire, and diminishing the heat of fires that do start, so that less injury is done to the trees and soil.

## PUBLICITY AND LUMBER SALES

The value of advertising in the lumber field was brought home to the North Carolina Pine Association at its recent annual convention by the report on advertising and the other work of the promotion department. The association is convinced of the value of advertising, and its devotion of a part of the advertising fund to newspapers has been an important feature in the new field of lumber advertising to the ultimate consumer, a campaign now spreading through all the lumber associations of the country. The experimental work with the newspapers was in Sunday editions. Over 100,000 pieces of mail matter were sent to architects and contractors, and nearly 65,000 to retail lumber dealers. The answers received from advertisements were as follows:—

| | |
|---|---|
| From technical and special circulation magazines from March 1, 1916, to Feb. 28, 1917 | 3,773 |
| From Sunday newspaper advertisements | 1,756 |
| From farm paper advertisements | 2,082 |

## NEWS AND VIEWS WANTED!

**Readers will greatly assist the Canadian Forestry Journal by sending to the Editor news and pictures of private woodlands, unusual stands or single specimens of trees, or such other subjects as may be judged of general interest.**

# Six-Sevenths of U. S. Fires Preventable

In most of the forest regions the weather conditions in 1915 were favorable for the prevention and suppression of forest fires, the Lake States being especially favored. There were no protracted droughts, though a few States experienced short periods of intense dryness and of high winds in the spring months. For in about 6,000,000 acres, or 1.1 per cent. of the 544,000,- nd Connecticut occurred in March and April, and 67 per cent. of the 1,101 fires in Pennsylvania in April.

The returns from the States having forest-fire protective systems show that most of the fires were controlled before gaining much headway, and that extensive and destructive fires were few in number, as compared with those in the States not so organized. These facts argue strongly for appropriations for the establishment of adequate systems of protection by all States. The suppression by a forest officer of a single fire in its incipiency may avoid a loss much greater than the annual appropriation for forest fire protection.

It is estimated that some 40,000 fires burned over about 6,000,000 acres, or 1.1 per cent. of the 544,400,- 000 acres of forest area in the United States. Of course, not all the timber on the land burned over was destroyed or damaged; in many fires the damage to standing timber is relatively small. Nevertheless, the money loss in timber and improvements alone was not less than $7,- 000,000 which does not include the loss in young tree-growth on large areas outside of the National Forests, and the very great damage from soil deterioration and floods.

Seventy-four per cent. of the fires were of known origin, and of these lightning—the only nonpreventable cause—started approximately one-seventh. Therefore the remaining six-sevenths were started by carelessness in some form or another, which is preventable. Of these the largest number was caused by brush burning and railroads. The proportion of fires due to these two largely preventable cases indicates strikingly the need for greater care on the part of both farmers and railroads. In the west the principal preventable cause was camp fires. Six out of every seven forest fires which occur can be prevented.—U.S. Dept. Agriculture.

## 450 PER CENT. JUMP IN PAPER

London, May 2.—The Express says that there is an acute crisis in the paper trade in Great Britain owing to submarine activities, and that imports of raw material have almost stopped. Several paper mills have been obliged to close, and imports in the last few weeks were only ten per cent. of the restricted amount allowed by the Government. There is no prospect of improvement, as every ton of shipping will be needed henceforth for food. A further reduction in the size of the newspapers is considered inevitable. Paper, which before the war cost the newspaper publishers two cents a pound, is now nine cents.

### A Correction

By an error in the last issue of the Journal the name of Mr. A. Clarence Lyman of Montreal was omitted from the list of Life Members joining in 1917.

Bad conditions in the principal forest-using industry, lumbering, are of no permanent benefit to anyone. Suspicion and hostility toward this industry will not help the public and get nowhere in meeting practical needs. It should be the concern of the public not only to keep the industry competitive but to cooperate with the lumberman in making his business more efficient.—*Wm. B. Greely, U.S. Forest Service.*

# Reforesting Norway With Douglas Fir

Douglas fir is recommended by Anton E. Smith, chief forester at Stavanger, for the reforestation of western Norway, whose former wealth of oak forest was exhausted hundreds of years ago. Mr. Smith is just returning to Norway after a year's study of American soft woods for the Norwegian government. He spent most of his time in Oregon, Washington, British Columbia and Alaska. The climate of western Norway is very similar to that of the states of the Pacific Northwest. Accordingly, Mr. Smith recommends Douglas fir, which, he believes, if planted in Norway, will attain merchantable size in about 80 years.

Norway has been cutting very heavily during that last decade, and the government has taken effective steps to safeguard the nation's timber supply, both by encouraging reforestation and by limiting the cutting to trees above 6¾ inches in diameter, measured five feet from the ground. Both pine and spruce are employed for paper making, the principal use to which timber is put.

# Hungry? Try Shredded Birch-O!

Some suggestive experiments have been recently carried out in Germany by G. Haberlandt, partly under official auspices, on the possibility of utilizing wood as food for animals and man. The first experiments were made on a sheep, in a respiration chamber, for the purpose of determining the digestibility and nutritive value of birch wood. The trees were felled in the early spring, and the trunks, measuring four to six inches in diameter, were reduced to very small chips in a paper mill. Microscopic examination showed that the wood was very finely divided, so that the membranes of nearly all the cells were destroyed, while the cell contents had been almost all removed by the water used in the preparation of wood. Thus the residue consisted chiefly of cellular membrane. The wood was fed in combination with other foods. Good results were obtained, both as to digestibility and nutritive value. Apparently the reason why previous experiments on the same subject had not been successful was that the wood was not cut up fine enough and its cells were not thoroughly torn. The experiments were repeated by Prof. Rubner on a dog, the same wood ration being fed with meat, and the results were also successful. Haberlandt believes that man is capable of digesting finely ground birch wood, and that it might replace rye or wheat to the extent of ten or fifteen per cent. in bread making.—(Scientific American.)

## AEROPLANE FOR SURVEY

A small aeroplane, to be used this summer in survey and reconnoiter work in the engineering summer camp in Kittitas county, is being constructed by J. W. Miller, assistant professor of civil engineering at the University of Washington. Mr. Miller will complete his machine sometime in May and if tests on the campus show it to be successful, he will take it to the camp.

The machine will have a spread of 24 feet and is designed to carry the aviator and 200 pounds of baggage. A low power rotary motor will be used in an attempt to get a slow speed airship.

# BRITAIN— CALLS TO CANADA—

## THE FACTORY THE FARM

## She must have Food—

for her Armies in the Field—for her Workers in the Factory—in the Munition plant—in the Shipyard—in the Mine.

### THERE'S DANGER IN SIGHT—BUT YOU CAN HELP

**Do You Know—**

that the rapidly rising price of food stuffs means that the World's reserve supply is getting small?

**Do You Know—**

that a world-wide famine can only be averted by increasing this supply?

**Do You Know—**

that a "food famine" would be a worse disaster to the Empire and her Allies than reverses in the Field?

**You Can—**

help thwart Germany's desperate submarine thrust on the high seas.

**You Can—**

do this by helping to make every bit of land in Canada produce—the very last pound of food stuffs of which it is capable.

**And Remember—**

that **no man can say that he has fully done his part**—who having land—be it garden patch, or farm, or ranch—fails to make it produce food to its utmost capacity.

**THESE FARM PRODUCTS ARE NEEDED FOR EXPORT**

**WHEAT,**
**OATS,**
**BEEF,**
**BACON,**
**CHEESE,**
**EGGS,**
**BUTTER,**
**POULTRY,**
**BEANS & PEAS,**
**WOOL,**
**FLAX AND FLAX FIBRE,**
**DRIED VEGETABLES**

## BRITAIN APPEALS TO CANADA

**THE NEAREST PRODUCER OF STAPLE FOODS**

India and Argentina are more than twice the distance away and Australia more than four times.

*Canada to Britain* - - - - 2625 MILES

*India & Argentina to Britain* 6000 MILES

*Australia to Britain* 11500 MILES

"No matter what difficulties may face us, the supreme duty of every man on the land is to use every thought and every energy in the direction of producing more—and still more."

MARTIN BURRELL,
Minister of Agriculture.

The Department invites every one desiring information on any subject relative to Farm and Garden, to write—

INFORMATION BUREAU

## DOMINION DEPARTMENT OF AGRICULTURE

OTTAWA

RENNIES SEEDS
PUREST-CLEANEST
MOST RELIABLE
GET CATALOGUE
AT BEST DEALERS
OR DIRECT
TORONTO - MONTREAL
WINNIPEG - VANCOUVER.

### J. R. BOOTH—90 YEARS OLD

A mammoth bouquet containing four score and ten American Beauty roses was the tribute of affection that employees of the Booth paper and lumber plants bestowed upon their aged employer John R. Booth, Canada's lumber king when he attained his ninetieth birthday in Ottawa on Thursday, April 5th.

Coincident with the ninetieth anniversary of his birth, John R. Booth made an unusual departure from his steadfast custom and "laid off" for a short time, but, he had a perfectly good reason for doing so. The occasion of the "lay off" was not occasioned by any desire for celebrating the anniversary of his birth, but, was for the purpose of saying "good-bye" to his nephew—Major Gordon Fleck of "A" Company, 231st Vancouver battalion—who passed through Ottawa on his way to Berlin via the western front. Had it not been for the departure of his nephew, it is

## Are Your 1917 Membership Fees Paid?

The Association's Usefulness This Year

Depends Upon Your Remittance!

## One Dollar Is Not Much! But——

But a thousand "ones" held back by forgetful members makes hard going for the Forestry Association. We have no endowment or reserve funds, no guaranteed revenues of any kind. If your 1917 fee is unpaid please tear off this coupon and put a dollar in a letter Now.

Canadian Forestry Ass.

This is my 1917 membership fee, covering subscription to the Canadian Forestry Journal.

.....

.....

probable that the ninetieth anniversary of the "lumber king's" birth would have passed without undue significance, for in the words of one of his workmen, "He's a fine man, but, he works hard."

Before the date of the ninetieth anniversary was over it is said John R. Booth, Sr., was back at his plant busy in superintending the operations of workmen in the erection of a new sulphite mill. It was 6.30 p.m. Wednesday before Mr. Booth considered it a "day's work."

### QUEBEC TO SELL LIMITS

According to an announcement made in Quebec recently, the Minister of Lands and Forests will offer for sale a large area of timber limits situated in different parts of the province, mainly in the Lake St. John region, the Saint Maurice Valley and in the Ottawa Superior district.

The numerous demands that have been made upon the Forest Department for over a year are said to justify the Provincial Government in making this sale, for which the time could not be better chosen. Quebec possesses an immense forestry domain a large part of which has remained unproductive up to the present. The present occasion is regarded as the most favorable for opening up the industry.

"Apart from the considerable revenue that this sale will give the province, as well as the cutting dues, etc.," says Pulp and Paper Magazine, "the Provincial Government will have the satisfaction of knowing that they are developing the forestry resources of the provinces, and are contributing to an improvement in the paper situation, and that its policy may tend towards a reduction in the price of this necessary commodity."

### ON HEALTH TRIP

Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines for the province of Ontario, is en route for British Guiana in search of health and will be absent several weeks. He was taken till during the session and has not been feeling up to the mark since.

**CONFEDERATION LIFE**
**ASSOCIATION**

**UNCONDITIONAL ACCUMULATION POLICIES**

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO

**Reinforce Your Defences With BOVRIL**

It re-inforces the line of defence just at the place—just at the time—you need it most. Colds, chills, influenza desperately endeavour to break down our resistance. Unless you are properly nourished these enemies will find your weak spot.

**BOVRIL IS CONCENTRATED BEEF.**

## FORESTS OF THE TROPICS

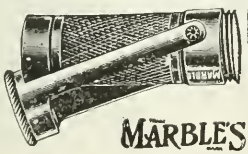
The history of every country in the process of development shows that excessive waste accompanies the exploitation of its natural resources. Primitive people of the tropics, by cutting and burning the virgin forest areas to practice a shifting system of agriculture, have in the past been the greatest enemies of tropical forests. Thus two-thirds of the area of the original forest of the Philippines disappeared before the remainder was brought under forest management. The virgin forest area of countries of Central America and the West Indies had either been completely destroyed or badly damaged.

In temperate countries excessive waste has been the rule everywhere until proper forest policies checked such waste.

The economic development of the tropics will be greatly aided by the avoidance of the mistakes made in handling the forest resources of temperate regions. This can be done only by the adoption of a suitable forest policy during the early stages of exploitation.

### *What is Needed*

What is needed is public appreciation of the value of the undeveloped forest resources and of the possibility of making them a permanent asset. This can be brought about by expert foresters who will not only direct operations in the woods but also arouse the public to the need of forest conservation, and assist in the formulating of a proper forest policy and in the enactment and enforcement of suitable legislation.—*Yale Forest School Bulletin.*

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In preparing this book the author has constantly kept in mind the experience which he gained while doing active work for the Forest Service in various parts of the United States.

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# *How Timber Is "Cruised"*

*From "Pointers" by Jas. D. Lacey Co. Chicago*

Having a tract of timber to cruise after the most accurate manner practicable in consideration of cost, we first send an expert woodsman, preferably the head cruiser who will be in charge, over the tract to fix upon a general plan of operations and prepare a preliminary report on the character of the timber. This report is the basis of instructions issued to the cruisers. Survey crews are then sent to the tract to locate the corners and lines, established perhaps many years before by government surveyors, and to survey and plainly mark out the minor subdivisions; also to set "tally stakes" for the guidance of the cruiser's compassmen.

When this work is well under way the cruisers are sent in and the actual estimating of the timber begins.

Before the cruiser actually begins the work of estimating the timber, he endeavors first to find windfalls of each species, which are representative types. If this is possible he measures the down tree with his tape. He ascertains the exact butt diameter, having chopped away the bark, and the diameter of each succeeding 32-foot or 16-foot log according to the basis of the estimate. By this method he is able to compute from the standard log scale the exact volume of the tree, taking it log for log, the average taper and the number of merchantable logs it contains. He uses these fallen trees as a standard of comparison by which to judge of the contents, the height and taper of those standing. His experience has taught him that trees of approximately the same age growing under the same conditions, will attain to approximately the same height, and will maintain the same degree of taper. It is vital to the accuracy of his work that the cruiser keep careful watch on the changing age, conditions and types of the timber through which he passes in the course of a day's work. Unconsciously he expects to find the tall clean timber in the draws or on well protected benches; while on the poorer exposures his woodsmanship prompts him to look for the shorter and more imperfect specimens. In a country notoriously free from windfalls, as is frequently the case in the western pine, the estimator often carries some one of the numerous mechanical devices designed to determine the height of standing timber. His steel tape is always in use as an aid and a check to his trained eye in arriving at the butt diameters. Experience has made the expert cruiser a good judge of taper—given him the ability to see at a glance whether a tree holds its size well up into the branches or whether it tapers off rapidly and fails to contain the amount of lumber that its butt diameter would indicate.

Years of practice have imprinted indelibly on the mind's eye of the competent cruiser certain forms and types and sizes, which to him represent certain known contents, and subconsciously these form standards of comparison upon which he bases his estimate upon given trees. By frequent reference to his volume table he has come to know, for example, that a tree 24 inches in butt diameter, containing three 32-foot logs with an average taper of 4 inches of the log—will cut 1,000 feet board measure, also that a tree 31 inches in diameter, four logs high, with a 5-inch taper contains 2,000 feet. Such standard trees are simply an index upon which to work; a rule of thumb, as it were, to systematize and simplify the work of the estimator and to add both speed and accuracy to his efforts. In other words, they serve to standardize his judgment. Should he find trees defective or malformed, he must deduct accordingly. Further, should he find trees that are seriously affected by fungi or any similarly serious diseases peculiar to certain species, he disregards them entirely.

### FOREST SCHOOL IN SIBERIA

The board of directors of the Vladivostok Commercial School at Vladivostok, Siberia, will transform the school into a polytechnical institution with several departments, among which the forestry branch will occupy a prominent place.

### J. H. WHITE APPOINTED

Mr. J. H. White, lecturer in botany and forestry in the University of Toronto, has been appointed Assistant Provincial Forester for Ontario. Mr. White has already assumed his new duties, in association with Mr. E. J. Zavitz, Provincial Forester for Ontario. An arrangement has been made whereby Mr. White will also be able to devote four hours a week to work in connection with the Forestry Faculty of the University.

### MUNICIPAL CAMPS

Fresno, California, has secured the use of 15 acres on the shores of Huntington lake, in the Sierra national forest, on which to establish a camp to provide summer outings for 11,000 school children and their parents. California State Normal School now occupies a portion of the same forest. In connection with the regular six-weeks summer course, this school gives a course in woodcraft and general forestry subjects. The students visit the nearby Forest Service ranger stations and lookout towers, and study the Government's methods of fire protection.


## Homesteads or Farm Lands

Oregon & California Railroad Co. Grant Lands, title to same revested in United States by act of Congress dated June 9, 1916. Two million, three hundred thousand acres to be opened for homesteads and sale. Timber and agricultural lands, containing some of best lands left in United States. Now is the Opportune time. Large sectional map showing lands and description of soil, climate, rainfall, elevations, etc., postpaid one dollar.

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# *Problem of Over Ripe Timber in B.C.*

That British Columbia stands today in greatest possible need of expert forestry, if for no other reason than getting the over-ripe forests of big timber off the ground so that the vast areas shall no longer be idle land, but producing forests for the wants of the coming generations, was a statement made by M. A. Grainger, chief forester for British Columbia, before a meeting of the Natural History Society, of Victoria, B.C. recently.

The proper business of forest land is to grow wood, as much wood as possible each year," said Mr. Grainger, "and once you get to the stage where there is no yearly increase in the wood on any acre, you are wasting the productive power of that acre. These over-ripe forests are simply timber storehouses. In British Columbia we figure that over half of the productive powers of our forest land is being wasted in this way now. There's no market for ripe lumber, and it can't be cut; that is one reason why you see the forest service trying to get more markets for British Columbia lumber to be sold in.

*When Increase Stops.*

"Practical tests on this coast have shown that the total amount of wood per acre of forest land ceased to increase much sooner than might be expected. To take, for instance, the Douglas fir, one might start with 300,000 little trees per acre. In the course of 20 years there would possibly be only a few hundred of the fittest left. The elimination would be gradual and continuous, until in the course of 300 or 400 years the logger would find but 10 or 20 big trees left.

"The quantity of wood standing on an acre increased steadily, while the stronger little trees grew up and destroyed the weaker ones until at the end of 100 years there would probably be as much timber on an acre as would make 100,000 feet of lumber. After 100 years, on the average, the quantity of wood would not increase; the trees would get bigger each year, but the loss by decay would offset the growth. It was there that practical

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expert forestry should step in to market the trees as fast as they reached marketable value and make way for a greater production of the land.

*Weed Trees.*

Just as weeds come in the garden to choke out the plant growths that were wanted, there are certain forms of forest growth that are undesirable, or at least less profitable. In the case of cedar, for instance, it is difficult to get new cedar growths without having them crowded out by hemlock. The problem is to get the one without the other. Jack pine is a prolific weed in the forest. In size it is only good for railway ties or mine props, yet its thick growth has monopolized much land that might be bearing good yellow pine, spruce, fir or larch. A great deal might be done to encourage the growth of the western soft pine in the interior and the perpetuation of the valuable Sitka spruce was a matter about which very little is known at the present time.

*Stock-Taking.*

"It can thus be seen that there is an immense field for important work to be done in the forestry service. Not the least important work should be the stock taking of our forest resources so that we may know the facts about the present timber crop and about the timber that is growing up to take its place. Land suited for agriculture must be located and separated from the areas that should be set aside for the perpetual growing of timber because they will not grow anything else.

"The development of British Columbia forestry will depend on technically trained men," said Mr. Grainger in conclusion, "and some means of training these men must be provided. At present our boys must go back east or to the United States to get their training. The British Columbia university—which provides training for teachers, for mining and civil engineers, for agriculturists—will not, I hope, remain long without a forestry school for training men to handle one of the biggest natural resources that any country has ever had."

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## DOES BARK SCRAPING HELP?

The following question and answer from "American Forestry" will interest many readers:

"Q. I wish to obtain your opinion relative to the practice, now so common, of scraping the outer bark from our shade trees for the purpose of removing scale and other insects, and furnishing no places for their concealment. Many of our most beautiful shade trees, generally elms, have been given this treatment and occasionally the trunk is afterwards painted with some insecticide. All this operation entails great expense to the tree owner. Personally I have been opposed to this treatment of trees, but I would appreciate a discussion from you on the subject.—W. W. M., Chicago, Illinois.

"A. There is no justification for the practice of scraping the bark of shade trees. It does no good and sometimes does harm and many varieties of shade trees, such as Norway maples, Oriental planes, etc., very seldom have any scale insects on their trunks. If you spray the infested trees with oil solution at the proper time, especially when the young scale insects hatch and become active, you will generally catch most of the insects, no matter where they are—under the loose bark or on top of it. Scraping off the old bark exposes very suddenly the young, tender bark underneath to sun, heat and dust and smoke, and produces better bait for scale insects than the old bark because scale insects prefer to live on young, tender bark. We think that if you would allow nature to take care of the loose, superfluous bark and not scrape it off prematurely, the trees would be better off."

# The Green Timber of the Heights

(BY A. J. C.)

In spite of an early start and steady climbing, it was nearly noon when we broke from the last thicket of young hemlock and gazed out over a fireswept hillside; a desolate scene of charred stumps and outcroppings of weathered granite. Our objective point, the timbered ridge that now showed plainly some miles ahead, had long challenged our curiosity; being visible from the lower country as a jagged skyline that varied in hue with the changing seasons from the pure white of its winter robe to the warm purple and gold of a summer sunset, its lights and shadows a daily source of delight and wonder.

*Where the Fireweed Grows*

It was hot, toilsome work across the path of the fire. The high sun darted his rays against the hillside at right angles and the heat quivered back from bare rock and blackened log as from a furnace. Behind every granite ledge the young fireweed was growing, promising a blaze of color later in the year. Scarcely nine months had passed since the fire had destroyed the growing timber, but small, tender shoots of the hardy willows were already springing from the burnt-out soil, striving to reclothe the naked land and bring back, each in its turn, the insect and bird-life which had fled or been destroyed.

*Blue Grouse and Blueberry*

A raven, glossy black in the strong light, flew slowly over our heads on heavy wings and perched, like a brooding spirit of destruction, on the splintered top of what had once been a noble tree. We left him, "monarch of all he surveyed," to his dismal croaking and, climbing upward, passed the edge of the burnt area at last and began to force our way once more through the familiar tangle of saplings and brushwood. Although not a bird was visible, the dreamy, monotonous call of the mating blue-grouse boomed and echoed all about us, vibrating through the warm, still air. We stumbled through vegetation containing many plants seldom found in the lower country. The devil's club spread its trailing limbs in a trap for the unwary, the broad leaves concealing the long sharp thorns which lay in waiting beneath. In every open glade the highbush blueberry blossomed, and right well did we mark the patches for our guidance in the fruiting-time.

*Deep in the Forest Primeval*

Our day of rambling and exploration was far spent when the thickets abruptly gave place to a cool, twilight forest of gigantic trees and the ground, clear of underbrush and carpeted with brown needles of the fir, stretched level before us. We were on the ridge! Untouched by axe or fire, rising, massive and straight until their heads were lost in one canopy of foliage, these stately trees formed a "forest primeval" such as few parts of the world can show. The change from our usual surroundings in the second-growth woods along the shore was so great that it seemed as though we had passed at one step into a foreign country. We moved forward noiselessly through the dim aisles of this noble woodland, the springy moss-covered floor deadening all sound. The vast girth and height of the trees, the semi-darkness under the dense roof of their foliage combined with the oppressive silence to give rise to a feeling of reverence akin to that awakened by the arched wonders and pealing organ music of some great cathedral.

*When Cook Sailed Straits*

The memory of that scarred hillside was still vivid; and to us, as woodsmen, there came a mental picture of a hurricane of fire roaring through this virgin forest, the heritage of generations to come, and destroying these mighty trees, unmatched in all the world, the outcome of centuries of growth, which, in their sapling

age, stood looking out over the blue straits when Cook dared the perils of reef and shoal.

It is early in the year to be thinking of bushfires when every southeaster still brings its drenching rain and the thickets steam under an hour of warm, spring sunshine, but, sooner or later, the period of danger will come, when the unreckoned wealth and the beauty of our woodlands will lie at the mercy of every careless, unthinking camper. The need for prevention is greater than ever this year. One by one the best of our sturdy fire-fighters of other days have heard the call, and gone to face another foe. In many outlying districts it will be but a scanty force that will muster with axe and mattock at the warden's summons. If there be one man who thinks it is not worth while, and who feels no responsibility in the matter, let him, at the first opportunity, take a "hike" up into the virgin woods, at the heels of a veteran timber cruiser, and he will be sluggish of blood and thick of head indeed if he come not back a determined and voluntary forest-guard.

## *Advertising to Head off Fire Season*

The wholesale and retail lumbermen of Canada are being asked this month by the Canadian Forestry Association to give effect to a new plan in forest protection publicity which should prove of utmost value.

Most firms carry advertising contracts in local newspapers. The association has prepared a special 'Forest Protection' advertisement and the lumbermen are requested to substitute this message for their regular 'copy' once or twice a month between May and October. Even where the town is far removed from standing timber, the attention of many campers, prospectors, hunters, etc., will be drawn to the argument for "Thrift In Forest Fires for 1917."

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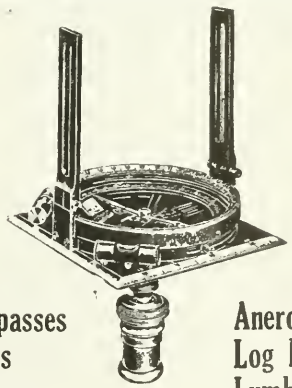

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## AN APPEAL TO CAMPERS.

The Canadian Forestry Association is endeavoring to secure the co-operation of Canadian fishermen, hunters and campers in making a special effort to adopt fire prevention this year as one of their personal contributions to national thrift.

Names and addresses of three thousand guides and sportsmen have been received, all of whom will receive a personal appeal to keep fire out of the forests in 1917 in-so-far as lies in their power.

The Association would be glad to hear from Quebec, New Brunswick and Nova Scotia members who are in a position to distribute special literature to campers and others, or who know of organizations of guides that can be brought into touch with fire prevention work.

A general newspaper and magazine campaign has been carried on this month, hundreds of newspapers from coast to coast assisting the Association by printing special articles appealing to pleasure seekers to take care of their camp fires and to adopt every precaution with fire in any form.

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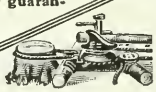

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# PLANTING TIME!

THE French Ambassador at Washington some years ago speaking of his acquaintance with trees remarked; "When I was a boy I planted a tree, so small I could hardly see it. A little while ago I went to learn how my boyhood friend had flourished; it had grown so big it could hardly see me."

This is Planting Time with the Canadian Forestry Association's Membership Roll. Since the commencement of 1917, extensive propagandist work has been carried on in most of the provinces. Everywhere the forest conservation cause is taking a remarkable hold on public sentiment. But the process of education must be widened and strengthened.

Your very best service for national conservation is to bring your neighbor into the Canadian Forestry Association. Our members aim to secure 1650 new members before the year closes. To make that as simple as possible, we have this Special Plan to place at your disposal.

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# Canadian Forestry Journal

Vol. XIII

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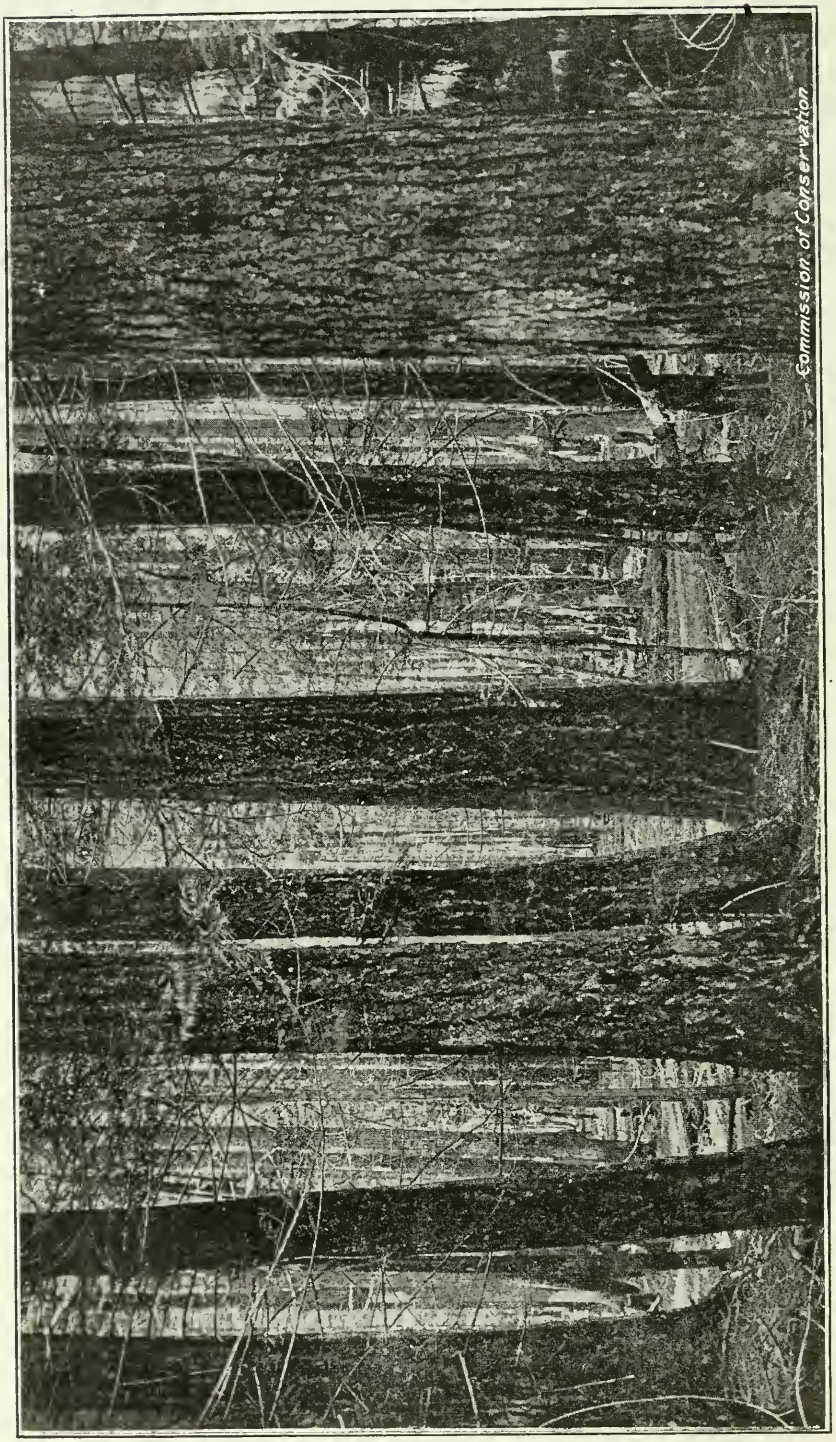



Courtesy Comm. of Conservation.

**HEAVY STAND OF DOUGLAS FIR, HEMLOCK AND CEDAR IN SOUTHWESTERN BRITISH COLUMBIA.**

# On Sea-Swept Sable Island

## How a Barren Spot in the Atlantic Defies all Tree Planting Schemes.

ONE hundred and eight miles off the coast of Nova Scotia, and lashed by the terrific storms of the Atlantic ocean lies Sable Island. It is one of the most interesting outriders of the whole Atlantic coast and constitutes not so much an asset as an international perplexity.

The battering of wind and wave has greatly reduced the island area, substituting here and there hidden sand bars for what was visible dry land but a few years before. To mariners, Sable Island represents a constantly increasing danger, despite the best efforts of the Canadian Marine department with modern light houses and sound signals.

In 1901, the late Dr. Saunders, as Director of the Central Experimental Farm, Ottawa, took steps to prevent the destruction of the island by planting out 80,000 trees and shrubs. The lack of success has probably put an end to all effort, to offset the disintegration of the remaining area. In reply to a question of the Forestry Journal, Dr. J. H. Grisdale, Director of the Central Experimental Farm, states that no work in planting on Sable Island, subsequent to that described in this article, has been done and that "very little success is expected from planting vegetation on this very exposed and windy island." It is likely that the task will have to be undertaken eventually by engineering devices.

On Sable Island, no trees grow naturally. It is formed entirely of white sand, and lies about 153 miles from Halifax.

### *Half The Land Gone.*

Its area has been considerably reduced by the action of wind and water. The present length of the island is about twenty-one miles, and its width, at its widest point, somewhat over a mile. Early surveys gave the length of the island as forty miles and its width two miles and more. Dangerous shoals and sandbars extend on all sides, and the strong currents from north and south often carry vessels out of their course, while, in addition to this, fogs are frequent, and wrecks are many. The planting was undertaken, at the request of the Marine Department, chiefly with the object of preventing the damage done to the island by the wind, for the further the destruction of the island is carried, the greater becomes the danger from the shoals and sand-bars.

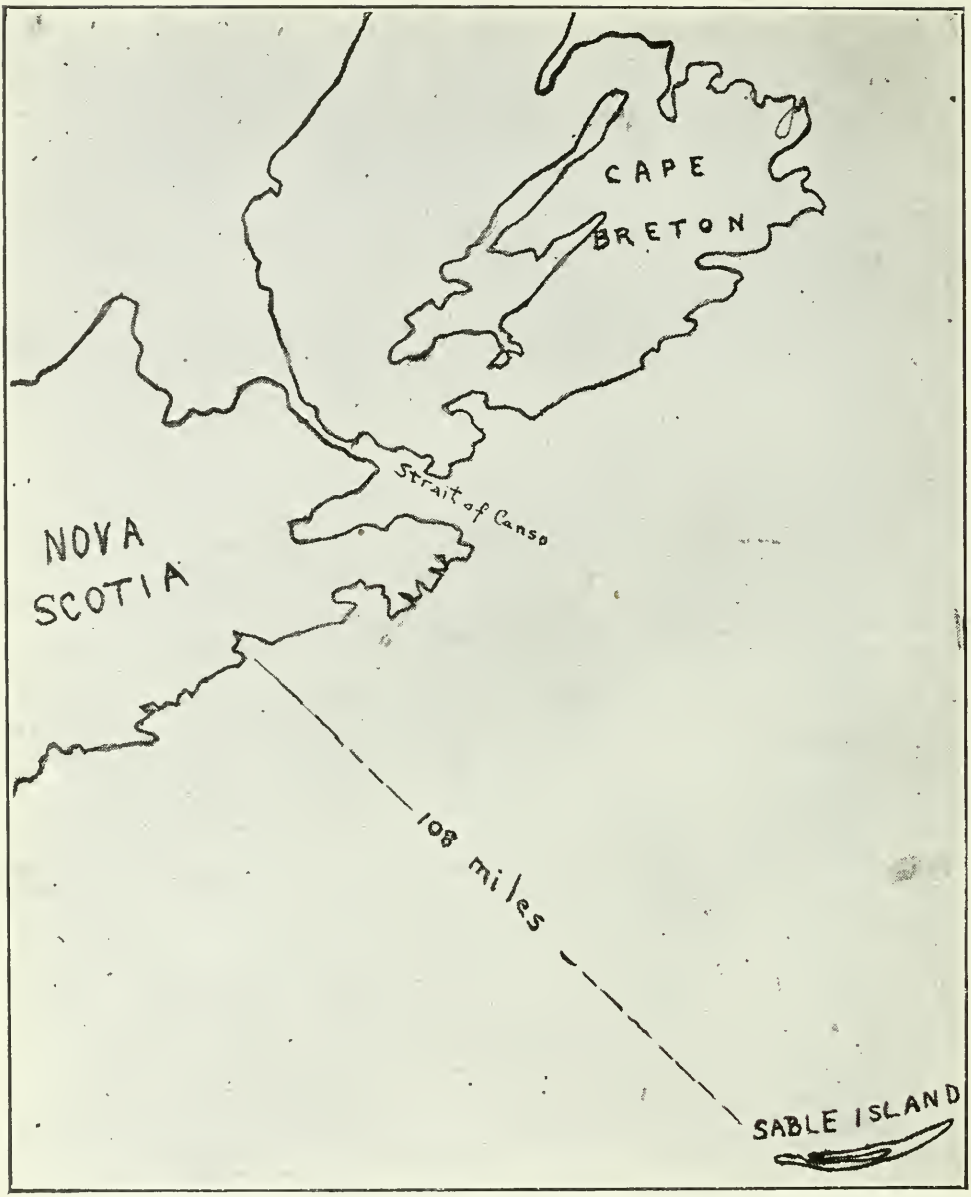
The choice of species to be planted was based largely on observations made by Dr. Saunders on a visit to Brittany, France, where much work in the reclaiming of sand-dunes has been done.

The first plantation was made on a sandy bluff near the north shore, fairly well covered with the common sand-binding grass, the trees being planted two-and-a-half to three feet apart each way in a soil composed of pure sand.

One considerable area, to which the name of Gourdeau Park was given, was found to be covered to the depth of several inches with a black, peaty soil, mixed with sand and underlaid with pure sand. On this were growing common juniper, cranberry, wax myrtle, blueberry, wild rose and other plants. The planting was completed on June 17th. Artificial fertilizers were used to some extent, these comprising nitrate of soda, muriate of potash, superphosphate of lime and quicklime.

### *Its Life-saving Value*

The climate of the island is not extreme. During the years of 1898 to 1901 (inclusive) the highest temperature registered by the thermometer was 78 degrees Fahrenheit. The




winds, however, are very high and constant and gales are frequent.

A danger to be apprehended is that the surface of the island may be wholly swept away (as has already happened in the case of a large part of the original island), leaving an immense area of submerged shoals. In that case the danger to passing vessels would be as great as now, and the possibilities of rescue of shipwrecked persons, (with the life-saving station gone) would be reduced to a minimum.

Three years ago, the Canadian Forestry Journal, touching upon the failure of the first experiments at Sable Island, asked:

"Is not such a danger worth the spending of many thousand dollars to avoid? On similar plantations (similar, at least, as regards the problems presented by natural conditions) France has spent several millions of

dollars, and the single state of Massachusetts some hundreds of thousands.

"In the problem presented by Sable Island not only do property considerations enter, but considerations involving the saving of human life. At the least the subject is worthy of continued and persistent experiment, and it is to be hoped that the authorities will not rest satisfied, or torpid, in consequence of the failure of this one attempt."

# Forestry Work for Women

By Mary Sutherland.

(*In charge of Forestry Seed-Beds at Aber, North Wales.*)

To make provision for planting operations after the War, the British Board of Agriculture have sown large quantities of forest-tree seeds. The following is an account of the work at one of the nurseries, and indicates one type of forest work which may be carried out successfully by women's labour:

A centre was established in the spring of last year, under the control of the Department of Agriculture of the University College of North Wales, Bangor, on the College farm at Aber, and for the greater part of the work female labour alone was employed.

The site chosen for the seed-beds was a field of about 2 acres, close to the shore of the Menai Straits, and quite unsheltered from sun and the prevailing west wind. The field, of which the soil was a moderately light loam, was ploughed, and harrowed in early spring, but if more time had been available would have benefited by still further cultivation.

The area was then measured out into seed-beds, these being 4 ft. 6 in. wide, with 1 ft. 6 in. paths betweeen each bed. The beds were of a length varying with the shape of the field, the longest averaging 60 yds.

The beds were brought to the necessary fine tilth by repeated raking over, and basic slag was raked in at the rate of about 10 cwt. per acre. This was followed, in the second week of May, by the sowing of the seed, this operation having been delayed by the bad weather.

Drills across the beds were marked out by means of a heavy wooden roller, of the same width as the bed, and having laths 2 in. wide affixed to the surface at intervals of 6 in. When drawn lengthways down the bed the roller left furrows 2 in. wide for the reception of the seed. The seed was sown evenly in the furrows, either from a seed-horn, or equally satisfactorily from an improvised horn made from a large glass bottle, having a wedge cut out of the cork, just large enough to allow for the passage of a few seeds at once. The seed was first coated with red lead to prevent it being eaten by mice and birds, and sowing was only carried out in fine weather when the soil was in a dry, friable condition suitable to receive and hold the seed. After distribution, a Spitzenberg drill roller was taken over each drill to cover the seed, and the whole operation was completed by drawing a light, wooden roller over the bed lengthwise to consolidate the surface.

Seedlings of Norway Spruce, which was the first species sown, were through the surface about a month later, a month being the average time of germination of all the species, except Douglas Fir, which took considerably longer, delay being due to the spell of dry weather after sowing, and during July. Once the Douglas Fir seedlings had started, however, growth was very rapid, and by autumn the beds showed a crop of good, strong seedlings, though these were fewer in number than the quantity of seed should have produced.

The beds were first weeded when the seedlings were just showing, and the weeding was carried on continually all through the summer. As a rule, hand-picking was the only satisfactory method of cleaning the beds, the

ENGLISH WOMEN CUTTING MINE BOOMS.
These war workers not only use the saw but carry and pile the logs.

seedlings being so very small. The Dutch hoe was used between the rows later on, to prevent a further crop of weeds making headway. Towards autumn, the beds were hoed as often as possible, in order to cultivate the soil between the growing seedlings, and, by preventing caking of the soil-surface, leave it open to weathering. The large area of paths considerably increased the difficulty of keeping the ground clean; rough hand-picking was periodically necessary until a weed-killer was used, which effectively cleaned the paths.

During the three summer months, on an average 7 girls, and for a shorter time a number of school-children, were employed in tending the seed-beds. The employment of women in this work, was eminently suitable as it required, speed and careful manipulation to carry it out with minimum amount of damage.

## *War Aviators for Forest Guarding*

The St. Maurice Forest Protective Association is trying to arrange for a test of an aeroplane for locating forest fires, and if this proves successful it hopes to introduce the aeroplane as a part of its mechanical equipment. There seems no reason to doubt that such a patrol would be much cheaper and more effective than the present ranger system, and if it should prove possible to land near a fire and extinguish it without calling for additional labor, the cost of fire protection would be very materially decreased.

A meeting was held recently in Montreal for the formation of a Montreal section of the Imperial Aero League and the question of the employment of these machines in commercial work of all kinds was discussed. Many aviators will be free after the war and they could be employed in carrying fast mail, forest fire protection, and many other services.

# Can Canada Sell John Bull His Wood Supply

## Some Reforms In Present Methods are Discussed by Overseas Officer.

THE following article was prepared by Captain Douglas Weir, B.S.A.; M.Sc.; officer in charge, Forestry Branch, Canadian Forestry Corps, with the assistance of Staff Sergeant A. V. Gilbert, a graduate of Toronto Forest School, and was read by Col. Gerald White at one of the meetings of the Imperial Institute held in London, England.

### *Germany's Timber*

"The Timber imports from Germany consisted mostly of Fir (Pine) and Spruce, but a great deal larger proportion came from Russia. The Fir is a variety of Pinus sylvestris, well known in this country as Scotch Fir and the spruce is Picea excelsa. To the trade in this country the Fir is usually known as redwood and the spruce as whitewood. These timbers have for years had Canadian competitors such as Douglas Fir, White Pine, Norway Pine and Spruces. The Douglas Fir, however, has been imported chiefly as large structural timbers, along with American Southern Pine. This latter is known here as Pitch Pine while the Douglas Fir is called Oregon Pine or British Columbia Pine. For general construction and manufactured articles white pine, red pine and spruces have been in demand, but of recent years the price of white pine has been prohibitive. The rapidly decreasing supply of this timber in Canada must also be noted. The Norway or Red Pine is considered superior to the European Red Wood but the Canadian Spruces have not been received so favourably, as it is held that they did not work up so nicely. These were, of course, the Eastern Canadian Spruces but the large imports from British Columbia of Sitka Spruce during the War, for the manufacture of aeroplanes have shown this to be a lighter, stronger and more durable timber than the eastern species.

### *Where Canada Failed*

It is important to note here the chief difficulties encountered in the past, in the entry of Canadian Species into competition with the European ones. The most important, of course, is transportation. This difficulty is off-set by the fact that Canadian timbers have, in the past, competed successfully here and more especially since the British Columbia Government sent their Chief Forester to this country to advance the interests of their timbers.

The question of finance also enters largely into the discussion. The Baltic exporters have worked harmoniously with British merchants in shipping timber on six months' notes, etc., whereas Canadian timber men have insisted on their timber being paid for before it left Canadian ports. In addition the former have paid more attention to having their own representatives here who studied the British markets closely, and their exporting firms would send timber here in varied forms to conform very closely to the uses to which they were put. Of recent years Canadian firms have shown more enterprise in having agents here, and the further application of this principle, in the future, should advance the use of Canadian timbers greatly and aid in solving the question of finance.

### *Loss by Shrinkage*

Another difficulty has been that timber from Canada did not arrive here in as good condition. Before the completion of the Panama Canal

timber often arrived here in very poor condition but even recently timber received here does not conform to the specifications that it is shipped under. This is, of course, due to shrinkage and dealers in this country consider that the timber was not seasoned before shipment, as well as the Baltic timber. The British Columbia timbers showed this defect to a much greater extent than eastern timbers. This difficulty can be easily overcome by the Canadian exporters.

Coming to the question of actual replacement of the Baltic timbers, we find that Canada is pre-eminently a valuable source of supply since Canada, especially British Columbia, has large timber resources and about 95% of the annual Canadian lumber cut is coniferous material. The question of Canadian species to be used must not depend alone on the suitability of different species for certain uses, but to a great extent on the available sources of supply both as to species and regions of Canada. The very valuable white Pine is being rapidly depleted in Canada. All eastern timbers are being exploited rapidly with the exception of the Spruces, hemlock and balsam fir which extend as far west as Alberta, and are present in large quantities in northern Ontario and Quebec, as yet almost untouched. British Columbia with its vast timber resources is the most logical source of supply for years to come as its very valuable and multiform species are still present in quantity.

*The Range of Woods*

Important Canadian woods in descending scale of available resources are Douglas Fir, Spruces, Eastern White Pine, Western Hemlock, Eastern Hemlock, Western Yellow Pine, Western Larch, Red Pine, Western Red Cedar, Western White Pine. Tamarack. Structural timbers in descending order of merit, and resources are Douglas Fir, Western Hemlock, Eastern Hemlock, Western Yellow Pine, Western Larch, Red Pine and Eastern Larch.

The importation of large structural timbers has been much greater during the war than in peace times. For mining timbers many Canadian species are available.

*Recommendations*

The outstanding features of this article are that Douglas Fir and Western Hemlock, available in very large quantities from British Columbia, should be imported to this country, principally for structural timbers but also for many other purposes, if transportation question can be solved. In addition the spruces and pines of Eastern Canada can replace Baltic timber for general construction, inside and outside finish, various manufactured articles and purposes too numerous to mention. Sitka Spruce (Silver Spruce) and other Spruces and Pines are also available from British Columbia. Since, as I understand, pulp is not manufactured to a great extent in Britain, pulp may be imported from Eastern Canada, as large quantities of spruce and balsam fir in Canada makes it possible to supply a great deal of this very necessary commodity, imported in the past, so largely from Scandinavian countries.

It should be noted that timber imports from Germany were not appreciable as compared with those from Russia, Finland, Norway and Sweden

A comparison of timber freights before the war shows approximately these rates:—

| | per standard. |
|---|---|
| From White Sea Ports .. | 32/6 to 37/6 |
| From Baltic Sea Ports.... | 20/ to 25/ |
| From St. Lawrence Ports | 35/ to 40/ |
| Gulf of Mexico Ports (Steamers) ..... | 70/ to 80/ |
| B.C. Ports (Sailors) ..... | £7 |

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From Mayor Costello of Calgary:—"I am very much in sympathy with the work of the Association and am enclosing application form for membership."

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"We realize our country suffers a lot through the loss of timber caused by fire each year, and you certainly have our strong support in the work you are endeavoring to do." The Farm and Ranch Review, Calgary.

SETTLERS IN KAMLOOPS, B.C. DISTRICT BURNING THE DEBRIS RESULTING FROM LAND CLEARING.

The fires were set out immediately following a rain and by the permission of a Government Forest Ranger.

# *Ontario's Forest Protection Work*

Ontario has entered the fire season of 1917 with a forest protection organization greatly superior to that of preceding years. By new legislation at the last session the Minister of Lands, Forests, and Mines, received authority to radically recast the entire scheme of forest fire prevention. No time was lost in appointment of proper officials who have been given ample leeway in securing for Ontario the benefits of modern forest guarding methods. The money appropriation for the work indicated the Minister's appreciation of the size of the job on hand, and his choice of officers has been generally hailed as well judged.

The chief executives of the new system are as follows:

Provinc al Forester: E. J. Zavitz; Assistant, J. H. White.

District chiefs: L. E. Bliss, stationed at Port Arthur. Ernest G. Poole, stationed at Cochrane; and A. J. McDonald stationed at North Bay.

As Mr. Bliss has already organized his district, he is given general supervision of the work in other districts. The task of selecting rangers, approving their appointment preparing fire report forms, fire warnings, etc. has involved the head office staff in a prodigious amount of work, nor is it to be expected that the organization proper will get its stride until next season.

The new department has applied its authority over settler's clearing fires, which are such a problem in Northern Ontario, and rangers are now requiring settlers to get permission before burning their slash. A number of motor cars have been purchased for the use of inspectors and rangers, and arrangements are being made for the construction of

preventive devices such as lookout towers, trails, telephone lines, etc. The portable fire pump, frequently mentioned in the Journal, has also been added to the equipment of several sections. That the rangers will be better organized, better instructed as to duties, and more closely inspected are results which seem bound to follow the plans now being worked out.

Following is a copy of the "permit" form issued to settlers, loggers, etc. intending to burn over their lands:

**FIRE PERMIT.**

**The Forest Fire Prevention Act, 1917.** No.....

Date..... .....191..... Ontario.

Authority is hereby granted to .....

Address.....to set out fire upon the following described lands.....

.....

for the purpose of .....

(State whether for clearing land, destroying logging slash, or other purpose) between the .....day of....., and the..... .....day of.....

191....., on compliance with the following conditions.....

.....

.....

The acreage to be burned over is.....

I have.....personally inspected the area.....

(not)

By.....

(Signature.)

FORESTRY BRANCH. .....

(Title.)

Note.—This permit is subject to revocation.

# *Forest Fires in Northern Ontario*

Newspaper reports claim that considerable areas of Ontario forest land have been swept by fires during the last weeks of May. No official report has been obtainable as this issue of the Journal goes to press. A despatch to the Toronto Globe from Fort William, May 29th, stated:—"Forest fires raging all through the organized and unorganized districts around Fort William and Port Arthur are destroying large areas of timber and uncut pulpwood. Bush fires have been raging in fully a hundred sections west of Fort William since last week, and great strips of forest in the unorganized sections of Conmee and beyond have been left blackened wastes.

"Rains to-day have done much to smother the fires, but the danger is not yet past. So far, no losses have been reported from outlying settlers.

From Sault Ste. Marie, Ont. came the following:—May 15.—"Dense smoke caused by heavy forest fires on the north shore are adding to the troubles of lake navigation. Very few boats were moving to-day, and so dense was the smoke in Whitefish Bay that the tugs were not able to work in the ice, and practically the entire upbound fleet has been compelled to come to anchor."

Fire conditions have been serious in the United States as well, as witness the following from Green Bay, Wisconsin:—May 21.—"Rhinelander Paper Company employees have been active in fighting forest fires in Oneida county during the last several days. The corporation equipped a special train for the men to go from Rhinelander to the burning districts. Dynamite and other supplies for stopping the progress of the fire were contained in the train.

Logs of paper mills in the central part of Wisconsin were destroyed while the fires burned in forests. Loss of several thousand dollars may result. Rain which fell Saturday stop-

ped most fires in the territory in northern and western Wisconsin."

The Peace River Country has had its fire experience this season. A newspaper despatch states:—May 10. —"Several large forest fires are sweeping through the timbered country back of the settlements here. South of town and east of the Smoky a fire is blazing fiercely over a country covered with dry poplar and brush. Down the Peace several blazes can be seen, but as none of the fires are in valuable timber no harm will result unless they spread too far.

The Pennsylvania Department of Forestry reports:—"A rough summary of the forest fire situation in Pennsylvania, issued May 21st, states that about 1,000 fires occurred before May 1st, over 750 reports and bills having been received to that date. It is evident that the number of fires will exceed last year's, but the area burned over to date is much smaller. The 760 fires reported averaged only eighty-six acres each, as compared with an average acreage per fire of 154 in 1916, and 306 in 1915. About 375 of the 750 fires were extinguished before they covered ten acres.

"The past week has been the worst fire week this year, and doubtless many small fires and several large ones will be reported. So far only a dozen fires of over a thousand acres have been reported."

## PASTOR AND FLOCK FIGHT FIRES

The Fort William Times-Journal has the following story:—"Had it not been for the presence of many villagers and settlers from the surrounding country who were gathered for public worship in the little church at Hymers Sunday morning, the village of Hymers would have been wiped out by fire, according to a statement made by George E. Hymers, of Hymers, who is in Port Arthur to-day. "Service was going on," Mr. Hymers said, "and the minister, Reverend J. Waldron, announced that the congregation was dismissed and everybody was to help fight the fire. The minister himself was one of the hardest workers in the bucket brigade which helped save the village from destruction." Thus, from soul saving the minister turned to property saving, and was instrumental in contributing largely to the success of the fire fighters and the salvation of the village.

Mr. Hymers said that the bush fires started some time early on Sunday, which raged fiercely on Sunday, visiting Hymer's village in a most menacing manner. There was not much damage to timber, because there is none in that immediate vicinity to be burnt, but some of the settlers in the outlying districts suffered heavy losses. Colin Campbell, of Harstone, is the heaviest loser, his saw mill, house and everything being consumed and 135,000 feet of lumber. William Winslow, of O'Connor, one of the best known agriculturalists in the district, lost his house, buildings, and everything he had. William Mountstephen, of Kakabeka Falls, lost his barns, which were on his farm in Conmee township, and others sustained lesser damage to outbuildings and lands by the fierce onrush of the flames.

Mr. Hymers estimates the total damage caused by the fires, which are still raging in that district, as over $10,000. Yesterday afternoon a long distance message reached Mr. Hymers from Hymers that the fires were coming down the ravine near the cheese factory, but that buildings were being watched and protected.

So far as has yet been ascertained, no actual cases of destitution have been reported, but all the settlers who have been visited by the fire king have sustained considerable loss in buildings and effects.

## MR. CAVERHILL RESIGNS

Mr. P. Z. Caverhill, Director of the New Brunswick Forest Survey, has resigned his position and will return to the British Columbia Forest Service.

# Nut Tree Growing in Island of Corsica

In an informative article advocating the growing of more nut trees in the United States and Canada, a writer in "American Forestry" gives many convincing illustrations of the customs of other lands where the produce from nut trees as well as the timber itself is considered a chief source of income. Of the chestnut tree cultivation in the Island of Corsica, the article says:—

"We have the very stimulating example of Corsica where mountain slopes as steep as a house roof and even steeper are clothed for miles in a continuous expanse of trees which look strangely like a forest, yet every tree is a grafted chestnut. Every acre is as valuable as good corn land in Indiana, and scattered along the magnificent macadam roads are the substantial stone villages of the numerous population that supports itself in comfortable prosperity from the combined income of chestnuts, chestnut wood, and the by-product of pasture and a small garden patch. The chestnut industry has continued in Corsica for centuries. Certainly the earth offers few examples of agriculture so permanent, so automatic, and so easy. When a Corsican gets pushed for money he goes out and cuts down an old giant worth often from $10 to $25 in American gold.

The practice of the Corsican mountaineers in their tree crop agriculture or fruitful forestry, whichever you choose to call it, is very suggestive of a proper method of handling the technical question of getting a stand of trees and keeping it, and at the same time utilizing the by produce of pasture. The Corsican goat, whose milk makes much good cheese, browses in the chestnut forests and keeps down most of the undergrowth. When a Corsican sees a chestnut tree which in five, ten, or twenty years is likely to be ready to go to the pulp mill, he goes off to his little nursery, digs out a ten-foot chestnut, and plants it near to one which it is to succeed. He puts two stakes beside it to keep it from being ridden down by the goats. When it is established in two or three years, he grafts it, and there it stands leading a submerged kind of life for five or twenty or thirty years. But when the old monarch by which it stands finally comes down, it is ready to spring promptly into rapid growth.

Lands with first-class climate are too valuable to grow mere wood. Some part of our country to the South as indicated by climatic studies, as well as by history and present development, seems not to have a first-class climate for the development of numerous, vigorous, energetic and healthy men. Here timber should be grown. Certain parts of America are too cold and have winters too long for the easy support of large numbers of people.

## SAWDUST STOPS FIRE

Recent experiments went to prove that sawdust is useful as a fire extinguisher. It was found to be very successful in quenching fires in oil, and much superior to sand for fires in tanks of inflammable liquids. Experiments were conducted with tanks of burning lacquer, though the same principles appear to apply largely to tanks of burning oil. The floating sawdust forms a blanket that shuts off the air from the flames; and sawdust itself catches fire only slowly, and then does not burn with a flame. The sawdust blanket was completely successful in putting out the fires in these tests. It made no difference whether the sawdust was wet or dry.

The efficiency of sawdust is greater on viscous than on thin liquids, as it floats more readily on the former than on the latter. The sawdust itself is not easily ignited, and when ignited it burns without a flame, and the burning embers have not sufficiently high temperature to re-ignite the liquid. Mixing sodium bicarbonate with the sawdust increases its efficiency materially.

WILD OLIVE TREES IN ALGIERS

The land not only furnishes sustenance to these revenue-producing trees but also excellent grazing for the numerous sheep seen browsing there.

BEARS 1200 LITERS OF ACORNS YEARLY

The food value of the annual crop of this evergreen oak tree near Algarve, Portugal, with its spread of fifty feet, is indicated by its record production of acorns.

Courtesy of "American Forestry."

# Timber Owners Place Over Million Acres in Care of Technical Forester

A few years ago, Gifford Pinchot in addressing the Camp-Fire Club of America said: "Forestry in the State of New York is flourishing everywhere except in the woods." It looks as if the old order were about to change. Professor A. B. Recknagel of the Department of Forestry, at Cornell University, has been granted a year's leave of absence from his university duties in order to accept the position of Forester to the Empire State Forest Products Association; he will take up his new duties on the first of July. He will establish headquarters for the Association at Albany. The work which Professor Recknagel will undertake marks a new departure in the practice of forestry by private owners in the United States. The Empire State Forest Products Association is made up of prominent lumbermen and paper manufacturers in New York; the members of the Association own upwards of one million two hundred thousand acres of timberland in this state. The Association, at its last annual meeting, decided to establish a rational and constructive system of forestry for the handling of these lands.

# *Canadian Foresters in British Camps*

A letter received from one of the Staff Sergeants of the Canadian Forestry Corps says, "All the forestry battalions have been fused into a Corps, and in addition constant reinforcements are being drafted into it from the medically unfit of the infantry. The Corps is at present about five thousand strong, of whom 1500 are operating in France, and increasing every day. There are about twenty camps in England and Scotland. One Branch at Headquarters is called the Forestry Branch and this handles the technical forestry work and also all lumber returns. Captain Weir, a graduate of Ontario Agricultural College, McGill and Cornell, is in charge, and Sergeant Bricker, a student from Toronto Forest School, is his Assistant. Men in the field were given the title of Forestry Representatives and handled several camps each, sending in general forestry reports embracing silvical studies, soil studies, growth studies, etc., as well as reports on progress, accompanied by maps. Several Toronto men were on this work. Our rank was the high and lofty one of full private except Parker, who was a sergeant before this work was started. He has recently gone to France where he will be associated with the lumbering end of the work, I believe. At present we are planning some new work at the instigation of the British Forestry authorities. A party is to be sent out to visit all our camps making volume and increment tables. We are going to use the forms which were used at Toronto University for stem analysis and volume tables. This is going to be very valuable experience for us and our time spent as soldiers will not be wasted. Since

the British authorities think that this is necessary, we can assume we are 'doing our bit.' There is a very serious shortage of timber, accentuated by the submarine blockade and all production work is being speeded up. The forestry exponents are using their influence to see that the government takes up the question of reforestation as soon as possible, some even advocating that this be commenced before the end of the war."

## "MON PREMIER LIVRE SUR LA FORET."

To date, fourteen thousand copies of this 32-page booklet, prepared by the Canadian Forestry Association for circulation in Quebec and in other French speaking districts of the Dominion, have been placed in the hands of school children.

As a means of assisting their educational campaigns, 4000 copies were purchased (at printer's cost) by the newly-formed Southern St. Lawrence Forest Protective Association and 2500 copies by the St. Maurice Forest Protective Association.

## REACHING TRAVELLERS

On three of the Canadian railways, the Canadian Forestry Journal is now installed as part of the parlor car reading equipment. Five copies are now used on the Canadian Government Railways, nineteen copies on the Grand Trunk and Grand Trunk Pacific, and the number required by the Canadian Northern is yet to be reported.

## GRAIN MEN IN LUMBER LINE

The Grain Growers Grain Co., Ltd., with headquarters at Winnipeg, are now building a sawmill on their timber limits 60 miles east of Fort George, B. C., on the Grand Trunk Pacific Railway. The Company has been conducting a large retail lumber business for the past few years. They now plan to manufacture their own lumber and supply the farmers direct. The new mill will cost about $185,000 and will have a capacity of twenty-five million feet per year.

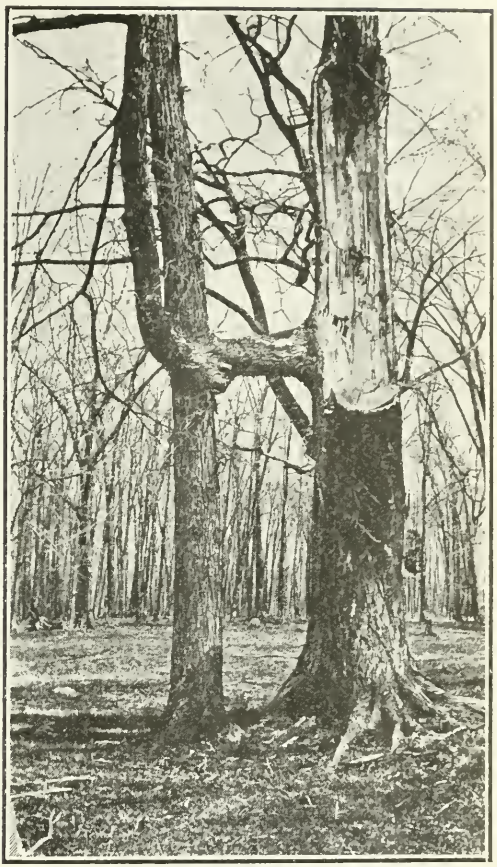


Photo by Joseph Boucher, Ottawa.

**A CURIOUS EXAMPLE OF A "WIND GRAFT" OF TWO ELMS.**

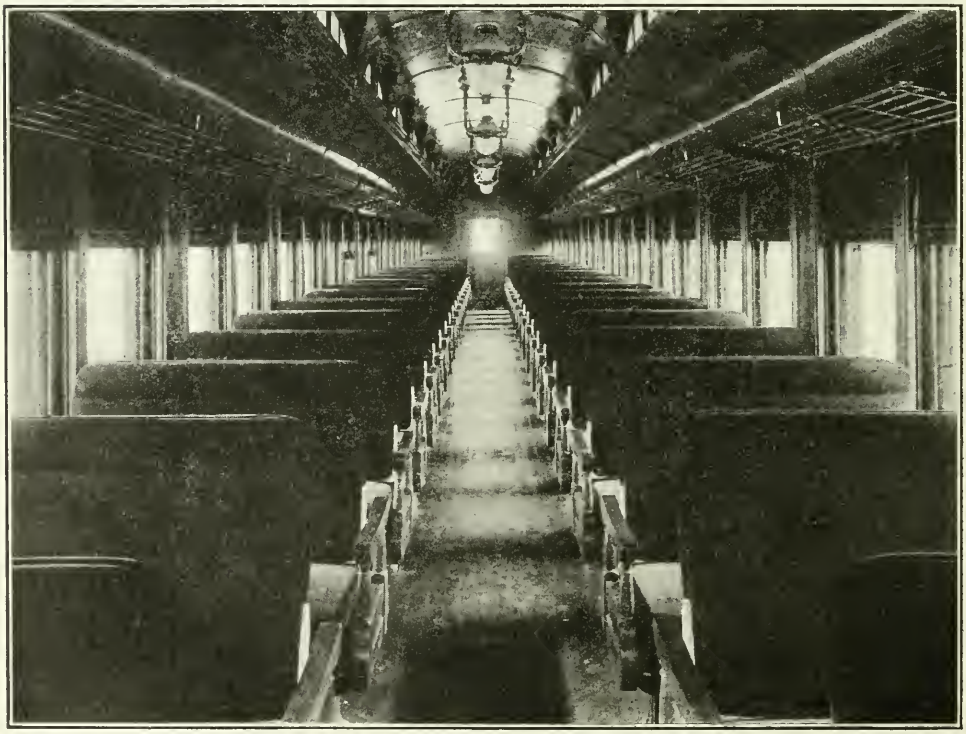
**The elbow from the larger elm is firmly grafted to the neighbouring tree, the parent meanwhile being killed by lightning.**

There is $500,000,000 invested in United States lumber plants.

"I want to assure you that our Association is ready to co-operate in any way you can suggest. While the direct object of our Association differs from yours, the work you are doing must necessarily appeal to us." Rev. T. J. Crowley, President, Sudbury District Game and Fish Protective Association, Copper Cliff, Ont.

# *Building a Railway Coach*

THE WOOD AND STEEL SKELETON OF A PASSENGER COACH.—Carlings of Birch and Ash, Floor of Maple, Stanchions of Hard Pine, Truss Planks of Hard Pine, Sash of Mahogany.



THE FINISHED COACH.—Seat Arms and Finish of Mahogany. Built by Canadian Car and Foundry Co., Ltd., Amherst, N.S.

# Nature's Warfare in Field and Forest

ELLEN R. C. WEBBER, PORT HANEY, B.C.

## The World Would Last Three Years If Animal Vigilantes Were Overmastered.

THE greatest enemy man has to fear is the insect life of the world. You are all more or less acquainted with the ravages of grasshoppers, the devastating march of the locusts, and the work of the destructive and ever dreaded "seventeen-year beetle." You have read of them, or experienced them to a certain degree.

I, myself, have seen in Wyoming, the "Army Locust" on his marsh across the grass-lands, when the train upon which I was traveling was held up for nearly three hours while the vast, greedy, greasy army was crossing the R. R. tracks. No wheel, depending upon its grip on steel, could make headway through the crushed, oily bodies.

In solid mass, half a mile in width, they crept leisurely on; and as far as the eye could see on either side of our steel roadway, they were coming, and going; and the land they had passed over was left bare of any vegetation.

We know that a farm of green grain or of corn, beautiful in the morning and ready for the harvesters' early coming, is, by a sudden raid of grasshoppers, but barren land at sunset; with labor, investment and hope all dead loss; as is the devoured crop.

Here in our own neighborhood you see the stripped gooseberry bushes; the eaten, dying leaves of some tree; the pale, yellowy green of some sickly appearing plant or shrub; all the result of the ravenous appetites of insect pests.

Our fruit trees are eaten through and through with the larvae of insects; the bark is sucked dry of its juices by tiny insects; the fruit injured and made valueless by their depredations. In the forests timber is destroyed; young trees killed; and in the garden our vegetables and flowers are attacked and lost; and insect life, in some form or stage, is the direct cause of our trouble.

### *World Would Last Three Years*

It has been estimated by those who give this question study and thought leading into actual statistics, that, were there no friends allied by nature, in the great struggle between man and his enemy insects, that in three years time there would be no life left on the earth;—vegetation would disappear first, and animal life would accompany and follow it.

Yet, daily, these tiny, allied soldiers of ours, to whom we owe our very existence; little soldiers recruited and trained by Almighty God for our

especial aid and service, are wantonly slaughtered by us; and only because we neglect to become acquainted with our natural—that is—God-given friends!

At this season of the year you may see along the country roads, almost any day, the crushed and battered body of a dull-hued snake. He was in life harmless, timid, without venom. Had he, through accident, and wholly without intention, intruded into your home or into the grateful warmth of your camp bed even, he would not have harmed you, for he had no weapon of defence only his swift speed, and his coloring, which blended so well with the ground;—his *uniform*, it is, for the Great Captain placed him, little, humble soldier,—to destroy man's enemies,—beetles, cockroaches, worms, mice, etc., such as congregate and multiply under stones, boards, low growing shrubs and crevices.

As long as he lives, daily during the season of multiplying insects and pests, he seeks and devours your enemies, and during the season when insect life is quiet, this little allied soldier is "off duty," and so goes away to rest and sleep, after a long unbroken stretch of active service. We see no snakes in winter; they are torpid; tired and "dead to the world" as you say, when you sleep heavily after a hard day's work.

With the warm spring days comes the rush of battle; and when, knowing this, he wakens from his rest to resume the fight for us, we, who should fight for him and his little life,—deliberately slay him!

Why?——Simply through an influence coming from an unenlightened age, by which we have for centuries been taught a mythical story, a legend older than Abraham by many hundreds of years, that snakes are accursed; a legend which well might have originated and carried weight in the earliest days of man, when the monsters of the Reptilian period were still numerous and powerful over the face of the earth. But through the periods during which man has grown into possession and need, the venomous snakes have grown less, and the harmless ones are now in the great majority.

That they are not accursed, is shown in the fact that they were given a work to do; and he to whom God gives a life of work, no matter how lowly, is not accursed, but loved and trusted.

### *The Lizard and His Insect Hunger*

Sometimes, in our woods, you see a tiny lizard; a minature crocodile; with bright beadlike eyes, a tapering body which elongates into a "tail" as we call it; and limbs, a close reproduction of those of the big crocodile you see in pictures. This is a little "swift;" a lover of sunny spots and rotten logs, upon which he is usually found; as here he seeks his insect food to a certain extent.

I was earnestly instructed lately, by a small boy, not on any account to go near one of these tiny reptilian, as he was a very dangerous fellow and might bite me, and so end my life! Poor, busy, little soldier Swift! How little is his friendly battling work understood and appreciated by those who should know him better.

Place him on your window sill, where the sun comes warm through the glass, and see how quickly and eagerly he will clear the flies away. To the forests, and through the forests to man,—he is a friend to be treasured, protected and cultivated.

Frogs also are insect eaters; and as such deserve to be spared the stoning that boys and girls thoughtlessly give them. Aside from the assistance they give us in our fight for existence, we should not ignore their musical ability; and their welcome Spring concerts;—who has not enjoyed them?

Toads, despised through ages of superstition as the embodiment of poison, and killed when found in gardens, as it was believed that persons had been known to die through eating a plant "at whose root a toad lay hidden," are still held in repugnance as the aftermath of this old, old belief.

But lovers of woodland friends and life know that the toad is a gentle, harmless friend; working night and day to destroy slugs, caterpillars, earwigs, flies and the thousand and one pestiferous insects that gather about our fruit, vegetables and flowers.

Take him into your house, and he will clear out flies, cockroaches, crickets and other small and unwelcome guests in the enemy line. How does he catch them? He "plays sleep" and when an insect comes near that which it considers a lump of earth, or a stone, Toady, who has been "peeking" through his nearly closed eyes, darts his long, thin, sticky tongue forward and quick as lightning, drops Insect down his wide, dark dungeon of a throat. The toad's tongue is like a spring; it is fastened to the front of his mouth, and folds back; and acts as quickly and surprisingly as a "Gee whiz" mouse trap.

### *"Lady bug" invited by a Government*

To be carefully guarded also is the little "Lady-bird" of "Lady-bug"—bright red, or yellowy brown, black spotted. You all know her, for you have all, in days passed, sent her home to her children in their burning home.

This tiny friend was introduced into British Columbia at Government expense; for she had not been placed here by Nature. She devours the, aphides; or green plant lice, found on the under side of plant foliage; or leaves

Do not permit her to be injured; but place her on some green plant in your garden, or by the wayside. Her value is far beyond her "weight in gold," many times over.

Other insect friends, disloyal to the traditions of their species perhaps. are the bee, the wasp, and the humble-bee.

The production of honey by the bee is only one of its benefits to man. The gathering of pollen and carrying it from blossom to blossom and tree to tree, serves to fertilize the blossoms of fruit and vegetables; and thus insures to us a good crop. This is a far more productive work than the manufacture of honey.

Wasps not only fertilize plants, but they also destroy spiders and flies. In each tiny cell of a wasp's nest, lies an egg of the mother wasp; and with it is sealed the body of a fly, preserved and torpid; stupified by the sting of the wasp, and left with the egg, to provide food for the young wasp until it is sufficiently developed to go forth and seek food for itself. The "mud-dabber," so named by the boys, makes the same provision with this exception, that she prefers spiders; nice large spiders, for the nourishment of her young.

So, in addition to the fertilization of plants, which is not done by them to the same extent as by the bee, the wasp aids in the destruction of health destroying insects.

The busy humble-bee, with his legs laden with yellow pollen, fertilizes shrubs, grasses, flowers, etc. His work lies more in the wildlands than in the garden, though he works there also.

Probably the one friend least known, most abhorred, despised, most eagerly put to death, is the skunk. His only offence is his defence; and it is quite sufficient. I know that he is blameless of much of which he is accused. I know, for I have personally cultivated his acquaintance, and have had as daily companions nine busy little skunks.

### *A Good Word for the Homely Skunk*

I could write a long chapter on skunks alone; but time only permits me to assure you that my close acquaintance with these little animals has taught me that chickens and eggs are as safe in their presence as with the canary in the cage. But beetles, moths, grubs—any and all insects were pure sport as well as food. In the garden, hills of squash or cucumber seed or corn were very seriously studied; and many were passed as perfect by these little hunters, or foraging parties. Others were eagerly and hastily dug open with the handlike fore-paws, and—were the seed eaten? Never! But always these

keen detectives picked out with one little paw hand, a white grub; and with much chattering among themselves and a curious, investigating sort of manner in looking the prize over. Sir Grub was quickly eaten, and the next hill studied.

In some mysterious way they seem to know just which hills contain the destructive but delicious grub; and these only are opened.

Moths were chased, as a kitten chases a feather; and when caught, as they nearly always were, the skunk sat up, and holding the moth in one hand, picked wings and legs off and threw them away; looked the stripped body over carefully, then ate it, and proceeded to catch another. If the skunk visits your garden in the night or early evening when the cabbage moths are busiest, or opens a hill or two of squash or corn, your garden needed him, and was better for his coming. If you and your dog would discreetly remain indoors as he made his skirmish against your enemies, he would not annoy you with his defensive, and would soon depart to the forest, there to resume his duties as a valued worker in the forestry department, in defending our timber from the enemy beetle.

We must not forget, in passing, our little friend the bat, who with the "night hawk," skims the air through the night hours, while the swallows are off duty.

*Working Day and Night Shifts*

As daylight dawns, these night guards retire to rest with stomachs and crops well packed with insects; and as they go off duty, the swallows come on, and so the work in man's fight for existence is systematically carried on by his little allies, whose slaughter of insects exceeds all computation, and even exceeds the imagination.

Even the hated cherry-bird, or Cedar Wax-Wing, whom I must admit appears to be an enemy, is in truth a friend; and saves for man far more fruit than he destroys through his warfare on insects and tree-destroying beetles. It would pay the farmer well to plant more rows of cherry trees for the use of the birds alone, as a trust and a reward for their services.

Owls and hawks destroy rats, mice and moles; as well as beetles; enemies whose damage could not be remedied with the price of a dozen hens from each farmer.

Sparrows destroy noxious weed seed; as do buntings, snowbirds, and many others of the same species.

Tree sparrows alone, in one small district are statistically reported to have destroyed, in one season, 875 tons of noxious weed seed.

*Birds' Eyes with Special Lenses*

Some tiny birds seek the eggs of insects; and are fitted, or armed, for this particular duty by the Great Captain; so that they are given microscopic lenses for their eyes; sharp claws to their feet, that they may cling to the bark of trees and hang back down as they peer under and around leaves, twigs and branches, in search of the, to us, invisible eggs which they destroy by millions.

The crows are scavenger birds, and work in the Health Department. We might count them in, almost, as a medical corps; for, while they do not cure sickness or wounds, they prevent sickness through the destruction of decaying and foul matter, which would pollute the air and breed disease.

The tiny humming bird lends a beak, and eats what he can of spiders and insects. All small birds which perch on trees, fences or shrubs, or dart through the air, are insect eaters, or weed destroyers, and should be protected by mankind, shielded and cared for.

I think that the saddest sight one recalls in bird slaughter, one which cries aloud of treason to friendship and allied service, is the wanton slaughter of woodpeckers.

The woodpecker is chief warden of our forests; our forests which mean to us not only the wealth of a great lumber industry, but also our water supply; our reserve of moisture for the long dry seasons; our daily conveniences,—but think this all out for yourselves; look about you and consider how you would be inconvenienced by the loss of your daily wooden comforts.

Our Government spends thousands of dollars each year; hundreds of thousands for wardens and utilities for the protection of these grand trees and their young growth, from destruction through the agency of man; but the Great Captain gave the guardianship of these very necessary forests into the keeping of this vast army of wardens, which we might call the Woodpecker battalions; of which there are three hundred and fifty; with subdivisions of companies in each battalion; commonly spoken of as "varieties."

Just note, in your camping weeks and forest jaunts, the many sorts of "Flickers," of Pileates; and "Sapsuckers."*

Note the differing numbers of toes; and the wonderful tail common to all, which acts as a prop and support against the branchless, perpendicular tree from which the little warden is extracting the destructive grub or beetle.

*The Woodpecker Wardens*

Very, very busy are the Woodpecker wardens; for we must remember that the wood-boring beetles alone, are an army opposed to man and his forests; and they outnumber the Woodpeckers in thousands against one; yet the beetles are, again, only one of many insect armies, kept in subjection by the valued woodpeckers.

Of course, we must not overlook the kind services of the skunk, the coon, the owl and the snake, who are, in a manner, the pickets or outposts; and gather in many hundreds of thousands of the enemy while they are in the beetle stage. But while all this helps, and greatly too, yet, alone it would prove inadequate; for the eggs and larvae of these enemies are so very numerous, that they supply two-thirds of all the food for these numerous woodpecker families, with their three hundred and fifty known branches, and hundreds of subdivisions.

It has been claimed that the woodpecker often cuts into a tree deeply and cruelly. So he does. But the death to that tree was lying curled securely at the end of the woodpeckers deeply cut tunnel; and, permitted to complete its stages of existence, would carry death to hundreds of other, otherwise, healthy trees.

Not only does woodpecker seek diligently for the great yellowy-white larvae, but he also gathers most industriously, by millions, the tiny eggs which he is enabled to discover through the wonderful lenses God gave for this purpose, in the gift of microscopic eyes.

The woodpecker, while denied the gift of song, is yet a lover of music? Only the male bird, in the wooing season, tries, through the agency of instrumental music, to atone for the vocal lack, imposed by nature? This is true. The long, rolling tattoo, so often heard in early summer, or spring, made by the iron-like beak of the woodpecker, in rapid vibration against a resonant dead tree or tall stump, is his music; his love call; his lure to his mate. So far as I have been able to note, this is his only recreation; this little half hour or so of music; indulged in for the wooing and for the entertainment of the mate as she sits on the nine white eggs, deep in the heart of some old hollow stump;—a well earned interval from the more materialistic duties of securing grubs from some afflicted tree, with which to feed his loved one.

I one day watched a woodpecker as he trolled out his love notes from a tall steel tower near my open window. It may have seemed a soothing note to the nest-tied wife of the musician, who spent just four bright, sunny hours

*As to the value of the "yellow-bellied sapsucker," Dr. Gordon Hewitt, Dominion Entomologist, pointed out in the May Forestry Journal that this variety is the only one of the woodpecker family that commonly attacks healthy trees.

in earnest endeavor to please her; though had I not been consumed with curiosity to know how long he would insanely hammer against that steel surface, I should have considered it nerve racking.

Now, just one little plea for the Flicker, locally known and misnamed "Sapsucker"—and most unjustly and falsely accused of being a destroyer of apple trees.

Apple trees, as you doubtless know, are often killed by the "apple-borer," who penetrates to the very heart of the tree, through a tiny tunnel which she bores for herself prior to depositing an egg at the end thereof.

Sometimes a tree will have thirty or more of these life-sapping holes; the tree grows weak, its foliage pale; and in spite of well intentioned remedies, (wrongly root-applied) the tree consumptively fades away. Were these larvae, result of the eggs in the tree, left to complete their development, soon the entire orchard would be dead. But friendly little Flicker, while extracting these deep hidden grubs with his long slender beak, breaking away the bark with which the eaten passages are covered,—is accused of being the originator of the deep inroads to the tree heart; and is further blamed for a habit of which he knows absolutely nothing:—that of "drinking the sap of the tree!"

*A Friendly Word for the "Sapsucker"*

In trying to save the orchard from further injuries through the borer, poor Flicker is misjudged; and pays for his friendly act with his truly valuable little life.

I have opened the crop of Flickers still warm after death at an apple tree; and have never found any signs of sap, or moisture beyond that naturally existing where a tightly packed mass of worms, insects and larvae were to be found; a quantity beyond belief, gathered by one tiny industrious, hungry, feathered ally.

It is hardly fair to all concerned that I should close even this incomplete introduction to our woodland friends, without mentioning the good work done by moles, gophers and ground worms; chiefly angleworms.

These little friends may seem of a doubtful order; but their endeavor lies largely in opneing and loosening the soil; admitting warm air, pulverizing and enriching soil, carrying leaves below the surface to decay and form loam; admitting moisture. The debt we owe to the despised angle worm, would, in itself require the resourses of an able paper to unfold.

The gopher in some localities becomes a menace; but the tiny mole no bigger than a mouse, is of more benefit than harm. It has never been proven that it eats the root of any plant; while his ventilation of the soil, preventing souring, and packing, is a great and good work for so tiny and helpless an animal.

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## WOODLOT PRESERVATION

While Old Ontario farmers are being instructed how to plant and care for trees, and admonished to care for and conserve their wood lots if they are so fortunate as to have them, the impression still prevails in New Ontario that the tree is the natural enemy of man, to be destroyed at sight wherever found. As a result, there are already farmers within a few miles of New Liskeard, says the Temiskaming Herald, who are compelled to buy wood from neighbors.

The wise farmer, however, will keep a few acres of his lot in timber to supply himself with firewood in time to come, and twenty or thirty years hence the Temiskaming farm with a wood lot will be worth more than an adjoining farm from which every last tree has been removed. On a great many farms, it is true, fire has been through every part of the bush and killed it out, but there are still quite a number where this is not the case, and where quite large patches of live timber can still be found.

Such bits of bush which it may be desired to keep can be preserved from danger by future fires by the clearing up of any dead-wood or underbrush

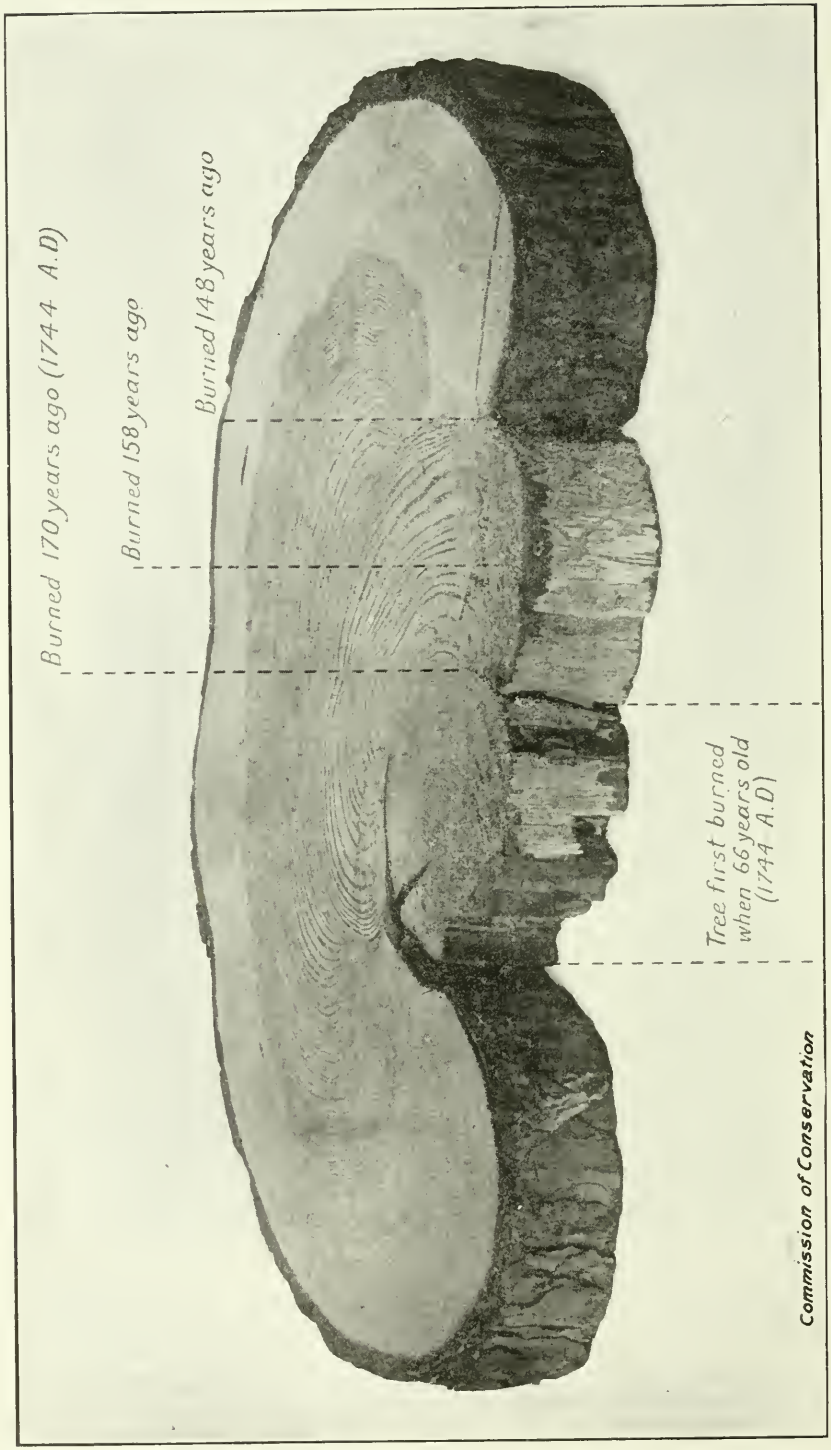
# Conditions Met in N.B. Forest Survey

STONEY SOIL, HURLEY BROOK

**The pile of stones was dug up by the farmer while removing a small stump. Such land will never pay interest charges on cost of clearing and should be retained permanently under timber.**

on the ground, and when this has been done and the surrounding land cleared of stumps, and put under cultivation, there will be little danger of the isolated woodlot falling a prey to flames.

In the years to come the farmer with ten or fifteen acres of good, sound, clean bush will find it about the most profitable bit of land on his farm.


Burned 170 years ago (1744 A.D)
Burned 158 years ago
Burned 148 years ago
Tree first burned when 66 years old (1744 A.D)
Commission of Conservation

SECTION OF A TREE TRUNK TO SHOW HOW THE DATES OF FIRES ARE ASCERTAINED FROM THE REMAINING SURVIVING TREES.
Each fire which injures the tree leaves a permanent scar and the date when it occurred can be determined or at least very closely approximated by counting the number of annual rings between the scar and the outer circumference of the tree.

# Notes on Newfoundland's Forests

Replying to a request of the Canadian Forestry Journal, Mr. J. D. Gilmour, General Logging Superintendent of the Anglo Newfoundland Development Company, and formerly of the British Columbia Forest Service has briefly touched upon some of the forest conditions of the island as follows:

The Anglo-Newfoundland Development Company owns a continuous block of timber lands, amounting to 2,316,000 acres, and comprising all the drainage area of the Exploits River from Grand Falls where the mills are situated, to the head. Twenty-five thousand horse power are developed at Grand Falls. The plant has a daily capacity of 184 tons sulphite and 192 tons newsprint. The product is shipped over a Company railway 22 miles long from the plant to Botwood Harbor. The usual difficulties in shipping to England have been met during the war, and part of the product has accordingly gone to the United States.

The timber is spruce and fir, the former being mostly black spruce. The white and red species also occur. The limits are well served by water, so that everything is driven to the mills and comparatively short hauls are necessary in the woods.

Logging is all done in winter from Oct. 1—May 1. More men are available then, and in summer the fire danger is great if camps are operated.

The company maintains a fire patrol, and uses lookout points with telephones. One feature where Canadian limit holders have a little advantage is that Canadian railways in timbered country must patrol their tracks at their own expense. Here an informal association of limit-holders, with Government assistance, performs the patrol on the Reid-Newfoundland Railway. However for five years they have succeeded in keeping down the fires from this cause, and that is the main thing.

This country as a whole is timbered best along the valleys and around the lakes of which there are an immense number. Wherever the land is flat, or away from a drainage system, there are bogs, some very large. At elevations of 1,000 feet above sea level barrens and bogs, the habitat of thousands of caribou, are the rule.

The greater portion of the island bears no timber, partly on account of these natural bogs and high barrens and partly on account of many disastrous fires in the past. This is the oldest British colony, and has suffered from fires longer than any other. As in other places, it is only in the last generation that any thought has been given to the matter of preventing them. The population for 400 years has always got its living mainly from the sea, so that there was, and is more indifference here than in the U.S.A. and Canada. However, in this respect an improvement is noted in recent years.

Clean cutting of all spruce and fir down to 5 inches D.B.H. is the method followed here, and careful inspection of logging operations leads to conservative cutting, low stumps, tops utilized to 4 inches, etc. The result is a very fine natural growth of fir and spruce, partly from volunteer growth, and partly from seed in the ground. If fires can be kept out (and there have been none in ten years logging since this company started operations) there is no question about a second crop.

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The use of tank cars for fire-fighting purposes is now in effect on the Canadian Pacific, Grand Trunk, Temiskaming and Northern Ontario and Canadian Government railways.

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Henri Mason, of Brussels, estimates the total loss of Belgium in buildings, equipment, stores and loss of trade at $1,060,288,000.

# Turning the Tree to New Account

By Dr. John S. Bates,
Sup't. Forest Products Laboratories, Montreal.

## How Canada Depends on Forest Supplies to keep the National Machine Running.

By far the most important and extensive utilization of wood consists in the manufacture of lumber and other products by mechanical processes, whereby the wood still retains its identity.

Under the heading of wood used in the rough, firewood takes first place and in value accounts for about 30 per cent. of the primary wood products. Air-dry wood has a calorific value rather more than half that of coal, pound for pound. The normal annual consumption of railway cross-ties in Canada is about 20,000,000 with an average value of about 45 cents each. Half of these are used for renewals showing the tremendous destruction which is mainly due to decay rather than mechanical wear. Only about 7 per cent. of the ties receive preservative treatment indicating the scope for extension of modern wood preservation processes in the case of a number of the Canadian tree species. Treatment with creosote and other preservatives is practised very extensively in the United States and especially in Europe with the result that the life of the tie is doubled in most cases.

### *Making Track Ties*

In order of importance the Canadian tie woods are jack pine, eastern cedar, Douglas fir, hemlock, tamarack, western larch and small quantities of other species. Hardwoods such as birch and maple are now coming into use, as creosote treatment successfully overcomes the low durability of hardwoods, and the ties have the advantage of high mechanical strength. Large numbers of wooden fence posts are used throughout the country but there are no accurate figures. The fence post problem is particularly important in the Prairie Provinces where the perishable poplar and willow are the only local woods available. An investigation of preservative treatment is now being carried out. The annual consumption of round mine timber is over 53 million linear feet with a total value of $524,000, while the mines consume sawn timber to the extent of 23 million feet board measure valued at about $304,000. About 140 coal and ore mines in Canada use timber, the leading woods being Douglas fir, spruce, balsam fir, lodgepole pine, jack pine and hemlock. The high humidity and elevated temperature in the mines promote rapid decay and it is likely that preservative treatment of mine timber will be taken up in Canada, at least for timber used in permanent haulways. The demand for poles has fallen off in recent years largely on account of decrease in telephone line construction. In 1914 the returns show 283,184 poles used with a value

of $660,262. The leading woods are eastern cedar, western red cedar, spruce and tamarack. Spruce and other piling is used quite extensively in Canada and forms an important export item.

*Spruce Most Widely Used*

The term lumber is used to include a wide range of material and constitutes the most important manufactured product A large proportion goes directly from the saw-mill into general building and construction without passing through an intermediate wood-working factory. In 1915 the lumber out in 3,239 mills totalled 3,242,676,000 feet board measure with a total value of $61,-919,806, which include a good deal of "structural timbers." Twenty-five kinds of wood are reported which represent about 50 distinct species. Spruce, white pine and Douglas fir account for about 75 per cent. of the total lumber out in Canada Hardwoods are of minor importance representing only about 6 per cent of the total lumber cut; birch is the leading species in point of quantity available The term "structural timbers" covers wood so used that its strength is a factor of first importance and includes timbers for mill construction, trestle and bridge timbers, wharf timbers, larger ship timbers, etc. The Divisions of Timber Tests and Timber Physics of the Forest Products Laboratories are now establishing authoritative data on the mechanical and physical properties of Canadian woods for the benefit of engineers, architects and others concerned with the grading of lumber and design of structures. The Canadian species in order of merit and resources are Douglas fir, western hemlock, eastern hemlock, western yellow pine, western larch, red pine and eastern larch. Douglas fir is fully equal to southern longleaf pine as a heavy structural timber and with the tremendous untouched resources in British Columbia is destined to become Canada's most important tree.

3 *Billion Shingles*

The rough manufactured products are too well known to require much discussion. Canada produces over 3 billion shingles annually, valued at nearly $6,000,000. Over half of these are made in British Columbia mostly from western red cedar. About 800 million laths are produced with a value of over $2,000,000, these being for the most part by-products from slabs and edgings. Treated wood-block paving is now used in a number of Canadian cities and throughout the world is placded in the first rank of city paving materials. Wood flour or wood meal is the fine, fluffy, absorbent fibre made by grinding wood chips in a stone mill or steel burr roller mill with a limited amount of water. It is used in the manufacture of dynamite, inlaid linoleum, oatmeal wall paper and wood plastics. Canada imports considerable quantities from Europe and the United States chiefly for the manufacture of dynamite and there is no reason why the industry should not be established in Canada for both local and export trade. Wood wool is a fine excelsior used in Europe for surgical dressings, filtering, stuffing mattresses and as a substitute for cotton waste.

Specially manufactured products include hundreds of different kinds of articles wholly or partly constructed of wood. In Canada this group accounts for 15 per cent. of the total wood cut. An economic principle underlying the proper use of wood is that each species of wood has a legitimate field of usefulness within which it should be employed. Custom, prejudice and lack of information frequently prevent the use of a species for some purpose for which it is naturally adapted. A large amount of accurate data still remains to be established and there is a wide field for technical research in determining the mechanical, physical and chemical characteristics of Canadian woods.

*Some By Products*

Special mention should be made of the by-products of the lumber industry since they constitute an enormous amount of wood material which for the most part is now going to waste. Utilization is retarded in

Canada on account of the scattered population and limited markets as well as the technical nature of many of the processes. It is estimated that the logging waste which is left in the woods represents about 25 per cent. of the original trees. Obviously the opportunities for utilization are limited and the main problem in Canada at present is to rigidly enforce the proper burning of slash in the wet seasons to remove this serious fire hazard and leave the woods in better condition for second growth. Other losses in the forest are due to fire, insects, fungi, wind, thick growth, scattered growth, local predominence of inferior species, mature trees not up to cutting standard, inaccessible timber and land-clearing operations. These are some of the problems which confront the forester and the im portance of the forest protective movement is emphasized when we remember that forest fires in Canada have destroyed perhaps ten times as much wood as has been taken out by the lumberman. The federal and provincial forestry branches and the various associations have done a great deal to safeguard our widespread forest resources and to secure the co-operation of the public in overcoming carelessness in the woods.

### 40 *Per Cent. Waste*

Saw-mill waste amounts to about 40 per cent. of the original tree, so that the finished lumber on the average represents from 30 to 35 per cent of the tree. New developments in the utilization of wood waste are being made continually but it is false economy to handle waste unless the by-product industries can be carried on at a profit. Effective utilization calls for a variety of chemical and mechanical processes which must be adapted to the form, species and quantity of wood waste available at any point. Slabs, edgings and trimmings represent 15-17 per cent. of the tree. Among the more common uses are fuel, laths, box shooks, small slack cooperage, small wooden articles, kraft and sulphite pulp, excelsior, wood flour, wood wool and producer gas. Sawdust accounts for another 11 per cent. and is used to some extent for fuel, producer gas, briquettes, polishing metals, insulating, packing, bedding in stables, floor sweeping compounds, composition flooring blocks, linoleum, improving clay soils, smoking meat and fish, blasting powders, wood flour, plastics, porous bricks, mixing with mortar and concrete, distillation, ethyl alcohol, oxalic acid and carborundum. Bark amounts to about 11 per cent. of the tree. It is usually used as fuel, although hemlock and oak barks are important in the tanning industry. A recent development is the use of spent hemlock bark for mixing to the extent of about 30 per cent with rag stock in the manufacture of roofing felts. Experiments on its use in wall board, indurated pails, conduits and wall paper give promise of success. In the manufacture of special wood products a good deal of wood is lost during seasoning by decay due to poor methods of storage and also by warping and splitting. There is a large waste in converting wood into the desired shape for the finished article. Proper co-ordination with plants making small wooden articles brings about a great economy of material. Shavings find use as fuel and to some extent for packing, bedding, drying wet land and manufacturing fibre board. Beechwood shavings are required in large quantity by vinegar factories but this is another case where specially cut wood is usually used instead of relying on by-product wood from various plants.

(*To be concluded in July issue.*)

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## PLANTING WHITE PINE

The Pennsylvania Department of Forestry has not suspended white pine planting because of the white pine blister disease. Almost fifty per cent. of the 3,750,000 trees planted on the State Forests this spring were white pine.

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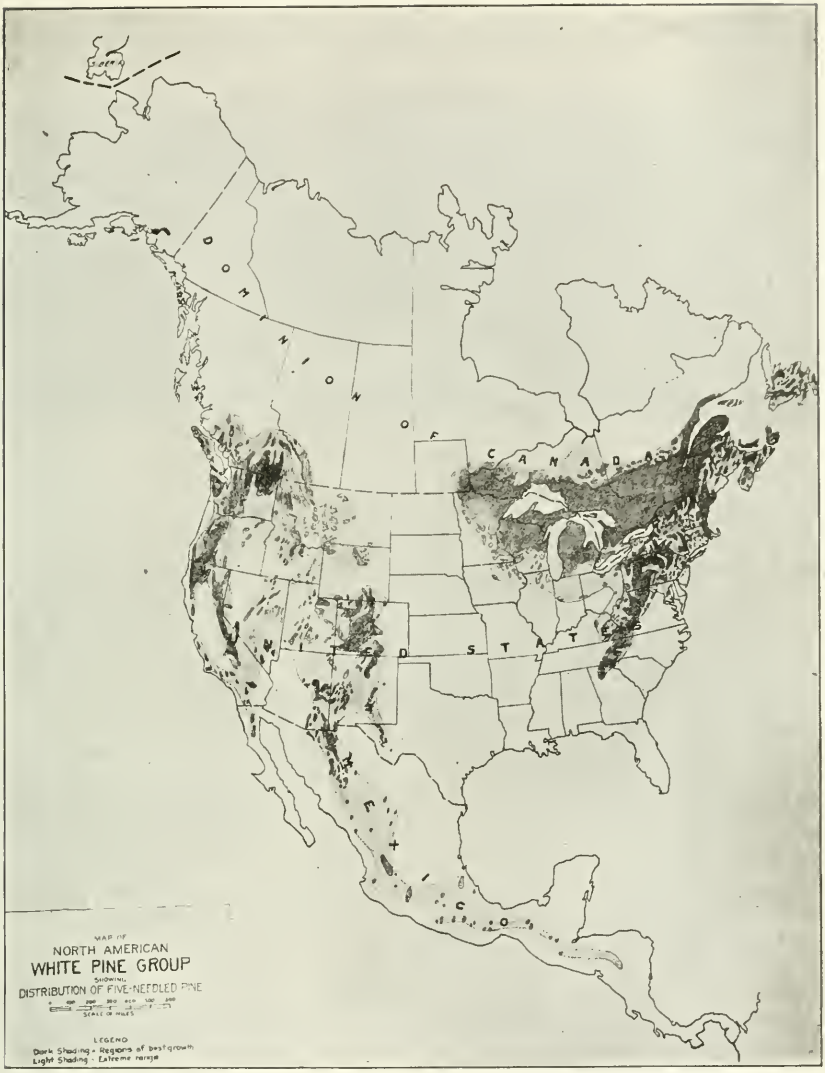
Canada has not one tree too many for present and future needs. We own just one quarter of the timber possessed by the United States.




Courtesy N.Y. State Conservation Commis.

**MAP OF NORTH AMERICAN WHIT PINE GROUP SHOWING DISTRIBUTION OF FIVE-NEEDLE PINES.**

**Dark shading represents region of best growth, light shading—extreme range.**

## SAVE THE WHITE PINE

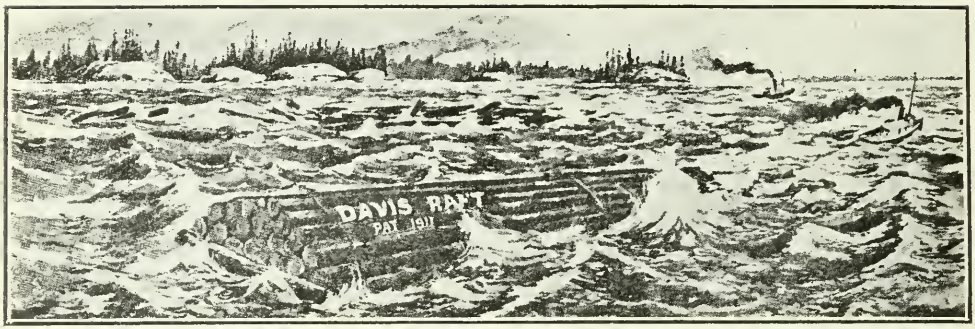
Canada's two hundred million dollars worth of white pine is menaced by a deadly disease, "Blister Rust."

Every reader of the Canadian Forestry Journal, residing near white pine areas has a public duty to perform in 'scouting' for infections of the disease. A special pamphlet, with graphic illustrations, has been issued by the Forestry Association.

Learn what the disease is and how it develops on white pine and on the 'host' plants, the currants, and gooseberries. The latter are essential to the transmission of the disease for it will not pass direct from pine to pine. Destruction of the 'host' plants will stop the progress of the Blister Rust. All trees infected should be destroyed by their owner.

Send your name to the Association office, 119 Booth Building, and secure a few copies of the pamphlets.

# *A New Log Boom for Rough Waters*




The ordinary form of log-boom, so familiar on the Pacific coast, is liable to be broken up and the logs lost, if the boom should be unfortunate enough to meet rough weather while in tow. Even in the comparatively sheltered waters along the coast large and valuable booms of logs are frequently lost, but the risk is considerably greater where the boom is to be towed through more exposed waters, where it is not unusual for the tow to go adrift, or a large portion of the logs escape with but small chances for recovery.

The losses from this cause have run into large figures annually and the risk from certain localities has been too great to permit the development of some valuable timber limits.

The new system of log-rafting patented by G. G. Davis, of Vancouver, is creating increasing interest among the loggers and mill men in British Columbia.

The illustration reproduced herewith will give an idea of the principles of the new system. This form of rafting may be constructed at a cost of 12c to 35c per M., depending on the locality and kind of timber. The percentage of loss in this system has been extremely low, while in the old method the loss in exposed waters, such as the west coast of Vancouver Island, has occasionally been as high as 50 per cent.

There was one Davis raft lost in Queen Charlotte Sound, the weather and sea having become so rough that the tug boat had to cut clear and run for shelter. This raft was last seen by a Japanese liner over 2000 miles at sea and still intact. Among other records of the success of this system is that of towing 30,000 feet of logs from Ocean Falls to Puget Sound, a distance of over 500 miles, without any loss whatever.

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What the forest fire thieves in one year would pay the premiums on $1,000 life insurance for 300,000 Canadians at 25 years of age.

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It would almost double the pensions on 19,000 disabled soldiers.

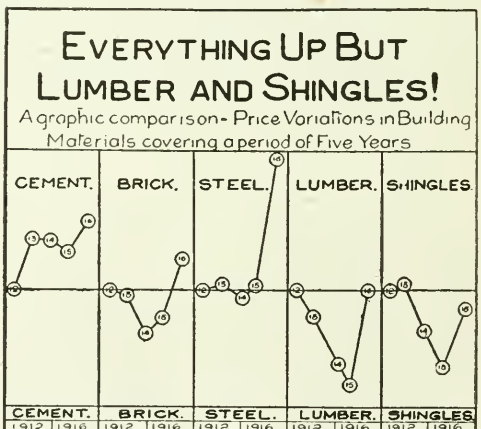

EVERYTHING UP BUT LUMBER AND SHINGLES!
A graphic comparison - Price Variations in Building Materials covering a period of Five Years
CEMENT.
BRICK.
STEEL.
LUMBER.
SHINGLES.
CEMENT. 1912 $1.26 1916 $1.67 32·6% ADVANCE
BRICK. 1912 $6.71 1916 $7.80 17·3% ADVANCE
STEEL. 1912 $1.62 1916 $2.65 63·5% ADVANCE
LUMBER. 1912 $22.49 1916 $22.64 0·6% ADVANCE
SHINGLES. 1912 $2.07 1916 $1.92 7·57% DECREASE

Chart showing the relatively small advances in the prices of lumber and shingles as compared with other building materials during the past five years.

# Peat Bogs as Sources of Fuel

As the fuel situation in Canada, and particularly in the prairie provinces, is drawing much public discussion, the Journal reproduces an interesting statement made by Mr. J. M. Macoun at a meeting of the Canadian Forestry Association some years ago.

"I would like to speak of the utilization of our peat bogs for fuel purposes. For at least 20 of the last 27 years my work has been in the parts of Canada lying between Hudson's Bay and the Mackenzie River. That is the part of Canada in which most of our large peat bogs are found. Without going into figures, I will venture to say that between Hudson's Bay and the Mackenzie River there are at least as many acres of peat bogs as there are of green growing timber. I don't mean on timbered land, because we know a great part of that country has been denuded. But I am quite certain that there are as many acres of peat bogs as there are of green growing timber. Now the natural question, not only for the whole country, but especially for this Forestry Association, is, what can we do to utilize those bogs? My work last summer, beginning in Ontario and extending through Manitoba and Saskatchewan, was to examine many of the larger bogs to see what they are worth for fuel purposes; that is, to ascertain their depth, the quality of the peat, and especially the possibilities of draining them. While I was working on that special question I naturally learned what I could, from the point of view of the forester. Speaking from this point of view, I think our Canadian bogs are of three kinds.

(1) The bogs that cannot be drained. When I say bogs that cannot be drained, of course we can drain anything; it is a mere matter of money—I mean bogs that from their situation, being in basins and that sort of thing, cannot profitably be drained. There are many of these bogs in Canada, and perhaps we cannot consider them at all from the forestry point of view.

(2) There are the bogs that can be completely drained without very great expense. I am entirely ignoring the question of the utilization of the bogs for fuel. A bog that can be completely drained will eventually be used to a very great extent for agricultural purposes.

(3) As far, however, as my experience goes, and that of those with whom I have talked, a great proportion of our bogs in Canada are of the kind that can be only partially drained. That is, it would be difficult to drain them completely, and yet some surface water can be taken off. When water leaves a bog it goes for good. That is, if you can lower the average height of the water in a bog one foot, even if it goes up to a higher level in the spring, still the average level will be permanently lowered. A somewhat trifling incident drew my attention to this matter whilst I was working on the Canadian Northern Railway, between Hudson Bay Junction and the Pas Mission. On the right of way between the rails and where the fences will ultimately be, the bog has been sufficiently drained to allow of a growth of aspen poplar along the whole length of the line, which for 89 miles runs through bog and swamp land. The bog itself is covered with spruce and tamarac, but I found young aspen poplar from one to two years old along practically the whole line, thus showing the effect of a little drainage. A year later, whilst working along the muskeg near Winnipeg—the largest muskeg in Canada—I found not only well grown poplars on either side of the track, but that the spruce and tamarac which had been growing on the bog for a great many years was very much larger where the land had been partially drained than it was fifty or one hundred yards away. The inference is that if we partially drain a bog, without reforesting at all, the young spruce and

tamarac already on it will have a much better chance to grow. The question of reforestation in our country must be left in the main to nature. If that fact is admitted, I am confident that a very little drainage of our bogs at a slight expenditure of money will work wonders.

## DISCOURAGES SPECULATION

A bill entitled "An act to amend the 'Forest Act'" has been introduced in the British Columbia Legislature by Hon. T. D. Patullo, Minister of Lands. The act contains a number of amendments to the existing act, which include regulations regarding the sale of crown timber for the manufacture of wood pulp. One clause states that in connection with such sales the Minister may require proof that the intending purchaser has spent not less than $350,000 upon the erection of a wood pulp and paper mill to be operated exclusively in connection with the limits under consideration; or, alternately, may require the intending purchaser to furnish a bond of $50,000 and other suitable guarantees for the expenditure of not less than $350,000 for the erection of such mill, of which not less than $100,000 shall be expended during each of the first two years of the license. Pulp licenses shall be limited by the output capacity of such mill, and shall not comprise at any one time more than thirty years' supply of pulpwood for the said mill.

## ABOUT BLACK SPRUCE

The extent and value of black spruce in Canada are frequently underestimated. The following correspondence appearing in the "Pulp and Paper Magazine," Montreal, will interests readers of the Forestry Journal:

"In the March 22nd issue of the "Pulp & Paper Magazine" I read an interesting article by P. L. Buttrick, on "The Red Spruce." In this connection may I call attention to the statement regarding black spruce (picea mariana). Mr. Buttrick says, " . . . it is a small and straggling tree, mostly confined to swamps and semi-barren hill-tops. Its only value lies in the occasional specimens which happen to get large enough to be harvested with red or white spruce."

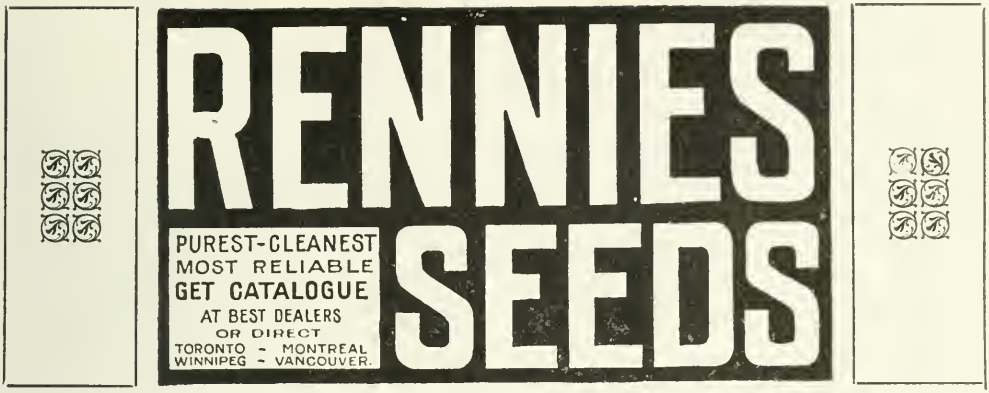
Speaking of the forests of Quebec and Ontario I should like to add that though black spruce does grow as "a small and straggling tree" on "semi-barren hill-tops and swamps," there are also thousands of square miles of black spruce forests running anywhere from 4 to 40 cords per acre. In the clay belt and flat lands of Northern Ontario and Quebec, probably 60 to 75 per cent. of the spruce is black spruce—a vast quantity considering that there must be more than two hundred million (200,000,000) cords of pulpwood in that region.

The black spruce is of course smaller than the white spruce, but the mature trees in the average black spruce swamp attain a height of 60 to 75 feet, giving 40 to 70 feet of timber, measuring 9 to 13 inches at butt, and 4 inches at top. In the virgin forests of the north as many as 500 to 600 black spruce trees (of 7-in. to 14-in. diam.) per acre have been counted.

Regarding the red spruce, Mr. Buttrick refers to it as the "epinette rouge" of the French Canadian. Now, strange to say, the French Canadian, when they speak of "epinette rouge" do not mean red spruce, but they have reference to tamarac. Epinette rouge is known as far north as the James Bay region, hundreds of miles out of the red spruce localities. "Epinette rouge sec," or dry tamarac, furnishes the best camp fire fuel of the north country.—R. O. Sweezey.

## SUNSHINE IN THE FOREST

"Sunshine" is a beautifully printed and arranged magazine issued by the Sun Life Assurance Company from the head office in Montreal. The last issue gave first place to articles on the forest resources of Canada, copiously illustrated, and clearly presented. Editors Emory and Steedman merit congratulations.




# *Printer's Ink as a Fire Preventive*

The willingness of leading Canadian firms to co-operate with the Canadian Forestry Association in inserting special advertisements in local papers setting forth the need for "Thrift in Forest Fires" this year is one of the most gratifying evidences of an awakened public spirit.

The Association submitted to four-hundred lumber and other wood-using firms a special form of advertisement, suggesting that it should take the place of the firm's regular ad. twice a month until September next.

With what good spirit the firms in question accepted the suggestion may be judged from the following excerpts representative of numerous letters received. Incidentally, it will be noted that many newspaper publishers have benefitted by the plan in the creation of new advertising customers. The excellent effect upon public sentiment in all the provinces, is self-evident.

From Dominion Match Co., Toronto:—"We are entirely in sympathy with the splendid work your association is doing in fighting the waste of forest fires.

We do not advertise very extensively but we will provide for the insertion of the 'copy' you sent us in a number of Canadian papers."

From Keewatin Lumber Co.:—"We have your favor of recent date enclosing advertisement copy which we will be pleased to have inserted in the three local papers in which we are carrying an advertisement."

Colonial Lumber Co., Pembroke, Ont.:—"I will have the advertising enclosed inserted in a Pembroke newspaper. The idea, I think, will produce results."

Schofield Paper Co., St. John, N.B.—"The only paper that we have any regular space in is the Maritime Merchant of Halifax and we will insert the copy there as requested."

The above letters suffice to illustrate how, in many parts of Canada, the advertising plan was carried out by the help of vigilant local firms.

## BLISTER RUST QUARANTINE

The U. S. Secretary of Agriculture has amended the white pine blister rust quarantine promulgated April 21, 1917. This amendment is made effective May 1, and prohibits the movement of white pines and black currant plants from the New England states to points outside of New England. This action was necessitated by the considerable movement now under way of possibly infected white pines, and to a less extent, black currants, from New England to states lying west and south. Both of these plants are important carriers of the blister rust disease, and most of the states to which these shipments were being made have state quarantines prohibiting the entry of such stock.

# *State Forestry in Ireland*

BY H. R. MACMILLAN

Ireland, alone of the four divisions of the United Kingdom, has made an organized beginning in State development of forestry. That this should be so is one of the fruits of the remedial land legislation of the last two decades. Mainly through the exertions of Sir Horace Plunkett and the movement for better use of the land, which he initiated and to which he lent such steady support, an Act was passed in 1899 creating for Ireland a Department of Agriculture and Technical Instruction, charged with the supervision of matters so unrelated as agriculture, forestry, technical instruction, fisheries and light houses.

Previous to the passing of this Act, Ireland had become the most distinctly agricultural portion of the United Kingdom. The area of woodland was steadily decreasing, and though there was a certain amount of tree planting by private owners, chiefly for shelter or beauty, there were practically no well managed woodlands. The land area of the island was, according to use, roughly divided as follows:

| | *Acres* |
|---|---|
| Use for agriculture (crops and pasture) | 15,250,000 |
| Mountain land | 2,208,000 |
| Peat, bog and marsh | 1,575,000 |
| Woods | 304,863 |
| Water, roads, fences | 1,033,000 |

The cultivated land was broken into very small holdings, averaging 25 to 30 acres each. The mountain land, which, according to many writers dealing with forestry in the British Isles, and according to the reports issued by various Commissions considering the subject, is the land most readily adaptable for forest purposes, could not be taken unreservedly as

**CONFEDERATION LIFE**
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**UNCONDITIONAL ACCUMULATION POLICIES**

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO

**Reinforce Your Defences With BOVRIL**

It re-inforces the line of defence just at the place—just at the time—you need it most. Colds, chills, influenza desperately endeavour to break down our resistance. Unless you are properly nourished these enemies will find your weak spot.

**BOVRIL IS CONCENTRATED BEEF.**

available for timber production. The small average size of the farms, the pressure of population, the dependence of agriculture upon farm stock give mountain land a high value for grazing during certain seasons of the year.

The value of such land in many localities may be taken at one sheep per acre. To withdraw the land from grazing, and it is probable that the best grazing land only would repay planting, would seriously disturb the agricultural population. Such disturbance could only be accomplished by a gradual change in the habits of the population, and by demonstrating that the profit from forest planting is greater than the profit from grazing, and that the plantations are on the whole, by affording employment for labor, more of a source of support to the community than the animals they displace

A large proportion of the mountain land cannot be expected to profitably produce timber. Due chiefly to the prevailing Southwest wind, which dries the trees out and checks growth, the upper limit of commercial forest in Ireland is about 1200 feet absolute elevation; the limit of the growth is in the neighborhood of 1500 feet. Towards the West coast, where the influence of the wind is more strongly felt, the limit of commercial forest is about 900 feet. As the upper limit of tillable land over the greater part of the island is around 700 feet there is not a great area, even not allowing for the grazing, available for commercial forest.

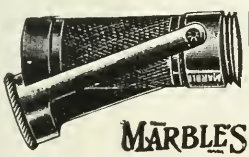
*Woodlands Broken Up*

The woodlands which go to make up the 300,000 existing acres of tree growth are chiefly in bodies of 1,000 acres or less. Previous to 1899, none belonged to the state. Small areas were degenerated forest, the remnants of early royal forests and perhaps of the forest primeval of the island. The greater part were plantations made within the past century. Unfortunately, the productivity of these forests is not what it should be because of the lack of silvicultural knowedge amongst farmers and landowners, this lack leading to poorly planned, poorly thinned and poorly tended plantations. The slow progress of forestry under private initiative in the past was undoubtedly due to the lack of silvicultural knowledge. Owners who made plantations received such poor financial results that neither they nor their neighbors were tempted to proceed farther with forest plantations.

The Department of Agriculture and Technical Education, therefore, had a varied problem to face when it undertook the improvement of the forest situation.

The first necessity was the building up of a competent technical staff. Soon after the passage of the Act, a Scotch forester, Mr. A. C. Forbes, entered the service of the Department as Chief Inspector of Forestry. The Department at that time was unable to devote money to forest work. The duties of the Chief Inspector were for a time confined to giving advice to private owners and making a forest survey of several Irish counties.

One of the most pressing needs for the improvement of existing woodlands was a higher standard of forestry knowledge. The Department, therefore, acquired in Wicklow, a well wooded county, the old homestead of Parnell, consisting of 300 acres of woodland and 200 acres of grassland upon which to conduct experimental planting work and establish a training school for foresters who might later enter the service of the state or of various owners of woodlands or plantations. Six working apprentices were taken in annually and given a course extending over three years. The number trained annually is not now so great owing to


Dry Matches
After all day in a boat, rainstorm or wet snow. Ask your dealer for
MARBLE'S WATERPROOF MATCH BOX
If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.
MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U. S. A.

the supply having caught up to the demand.

The chief attention at this, the leading forest station in Ireland, is now centered on conducting experiments in the planting of species presumably adapted to Irish conditions. An Arboretum has been established and over 100 acres of sample plots of various species planted. The average cost of planting with two-year-old plants at the rate of 3,000 per acre has been about $34.20 per acre.

Many North American species have been tried and the results given during the first five years by the North American species, as compared with European and other species, are interesting. The plantations are on a light loamy soil. The rainfall averages 40 inches per annum. While the winter temperature does not go below 10 to 20 degrees F., there are frequent frosts in May and June which seriously affect many species. The climate is typical of that of the greater part of Ireland. The elevation varies from 200 to 450 feet. The plantations are in nearly all cases evenly mixed with nurse trees of European larch, and are spaced about 4 by 4 feet, the plots varying in size from one to three acres. North American species are evidently better adapted to Irish needs than many of the European species. Those species from the Pacific coast seem especially provided for Irish condtions. Nine of the eighteen conifers showing the best results up to date are North American and of these, eight are from the Pacific coast.

### *Effects of Land Policy*

A Land Act passed in 1903 had resulted in the purchase of estates by the government in order that the agricultural lands comprised within the estate might be distributed amongst the tenants in pursuance of the policy of breaking up the large estates. There frequently remained wooded areas for which no disposition was possible to the Government Estate Commissioners except the sale and clearing off of the timber. Under this policy the area of forest land was actually being decreased through Government action. According, in 1908, an annual grant of $28,000 was made for the acquisition and management of such tracts. The Department had up to 1914 acquired ten timbered areas varying in size from 240 to 1900 acres and totaling 7,000 acres. These are under permanent management by the Department as demonstration areas and as local sources of timber. About 800 acres have been planted in these woodlots.

A Departmental Committee on Forestry in Ireland, of which the Chief Inspector of Forestry was a member, recommended that an area of 200,000 acres of mountain land should be purchased and planted for forest purposes. It was estimated that of the 2,000,000 acres of mountain land in the country this much at least might safely and profitably be used for timber production and that argument about the total area available might reasonably be left until action had been taken on 200,000 acres as a start. Obstacles are numerous in the way of public purchase of land in the British Isles. A strong fear of the nationalization of land exists in certain quarters. The titles and usages existing over the land are frequently complicated, making it difficult to secure the land required from the various parties interested at a reasonable valuation. The agricultural habits of each community have become so settled that the removal of a few hundred or a few thousand acres from the grazing resources of a valley inevitably involves difficult readjustment. The Irish Forest Department alone has overcome these difficulties in any measure by actually purchasing land for planting. An advance of $120,000 was made in 1910 by the Development Fund for acquisition and replanting of mountain land. Up to 1914, 7,000 acres, in three blocks, had been purchased, and further purchases were under consideration. The cost varied from $9.60 to $14.40 per acre. Planting is now started in these areas. The aim of management of these areas is to increase the block of public forest in each centre of an economical size for management of 2,000 to 5,000

acres, and produce timber for the needs of the surrounding population.

*No Regard for Tree Values*

Land Acts passed in 1903 and 1909 provided for advance of money by the government to tenants to enable them to purchase the land under their occupation. Numerous purchases have been made in this manner and it has been found that the tendency of the new owners has been to destroy the existing woodlands.

The Forest Department has therefore been given power to require the preservation and proper management of this timber, and is thus placed in the position of being able to further influence farm forestry. Important educational work is being carried on by the officers of the Department in making working plans for and giving advice to private owners.

Powers, granted under the Agricultural and Technical Instruction Act allow county councils to raise taxes for the acquisition and preservation of woodlands. Three counties have acquired forest land in this manner. Counties may also, guided by the advice of the Department, raise money by taxation for the purchase of trees for distribution to agricultural owners. Altogether, up to 1914, about 1,000,000 trees had been distributed to planters by counties.

The forest work of Ireland is now carried on by an annual vote of $48,000, in addition to the $120,000 advance from the Development Fund.


## Homesteads or Farm Lands

Oregon & California Railroad Co. Grant Lands, title to same revested in United States by act of Congress dated June 9, 1916. Two million, three hundred thousand acres to be opened for homesteads and sale. Timber and agricultural lands, containing some of best lands left in United States. Now is the Opportune time. Large sectional map showing lands and description of soil, climate, rainfall, elevations, etc., postpaid one dollar.

**Grant Lands Locating Co.**

Box 610, Portland, Oregon.

# 50 CTS.

# WAR TIME SPECIAL OFFER

## ONE WHOLE YEAR FOR FIFTY CENTS!

We are desirous of adding 1,000 new names to our list this month and to make it a certainty that we will not be disappointed we are offering

## ROD AND GUN IN CANADA

to you and 999 others for Twelve Months for 50 cents.

**W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.**

The superior staff consists of the Chief Inspector of Forestry and two foresters as Assistant Inspectors, in addition to a trained foreman in charge of the chief planting and forest stations.

*Schemes too Radical*

The work can only be increased when the funds are increased, which is unlikely at present. The start already made, in addition to breaking the ice for the British Isles, cannot help but be of great effect in influencing the standard of forestry practised by land owners and (by showing results) in leading to the further state purchase of land for forest planting. The propaganda work carried on in Great Britain has not been of the proper type. The schemes proposed have been too sweeping and have frightened governments, land owners and tax payers alike. The published details, by being interwoven with plans for the utilization of the unemployed and by providing for the planting of areas not likely to produce timber at a profit, and by sweeping away grazing rights and moor lands at a stroke have earned for forest planting more opponents than friends. The industrial side of the question does not appear to have been sufficiently treated. It has not been made sufficiently clear, in a local manner, how the existence of even small forest areas would benefit towns and industries. Though the utilization of home resources is a burning topic in Britain, but little has been said of the present wasted forest opportunity, bound to continue so long as the planted and managed forests of France supply pit props to the coal mines lying beneath the denuded hills and valleys of Wales.

## CANOES STAMPED FROM VENEER

A new use for wood has been developed in Michigan in the making of canoes by a new system. The new idea is the stamping out of the finished canoe, from veneer, instead of the old-fashioned manner of building up a canoe from ribs of prepared wood, and the cutting of the thwarts and gunwales, and the covering of the whole with canvas.

No wonder newsprint is scarce. There are 2,580 daily newspapers in the United States. Over 800 have gone out of business since the rise in paper prices began.

HANDBOOK OF TREES OF THE NORTHERN STATES AND CANADA

By Romeyn B. Hough.

Is photo-descriptive of the leaves, fruits, barks, branchlets, etc., and shows them all with the vividness of reality. Natural sizes ingeniously indicated. Distributions shown by maps. Wood structures by photo-micrographs.

"With it one wholly unfamiliar with botany can easily identify the trees."—Melvil Dewey, Pres. Library Institute.

"The most ideal Handbook I have seen."—C. Hart Merriam.

"The most valuable guide to the subjects ever written."—Springfield Republican.

AMERICAN WOODS

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# *Clergymen Aid with Fire Warnings*

One of the many plans employed by the Canadian Forestry Association to head off the fire season by appeals to the Canadian public for care and co-operation, was the sending of letters to four thousand Canadian clergymen of all denominations and in all the provinces, suggesting Sunday, June 3rd as a "Forest Conservation Sunday." To the French-speaking Roman Catholic clergy of Quebec, the date of June 10th was suggested, the notices being arranged in French and with special reference to Quebec.

The English form of letter and the pulpit announcement were as follows:

"Sunday, June 3rd, 1917, has been suggested as Forest Conservation Sunday throughout the Dominion. Annually the needless loss of life and property through individual carelessness with fire in the forests has been the subject of many sermons. Last year a score of effective pulpit addresses were based upon the Northern Ontario holocaust.

Do you not regard it as desirable that a few words should be spoken *in advance of* the season of forest fire hazard so that 1917 may be spared the tragic sacrifice of 265 lives and a loss of from four to six million dollars worth of property such as characterized 1916?

A pronouncement by the clergymen of Canada at this time will help achieve a result of the highest national importance.

Yours sincerely,

CANADIAN FORESTRY ASSOCIATION.

*The Pulpit Notice*

"At this season when the hazard of forest fires throughout Canada is reaching its height and the country is threatened with tragic loss of life and property, I have been asked by the Canadian Forestry Association of Ottawa to bring the following statement to the attention of this congregation:

Every year the careless conduct of settlers, campers, sportsmen, prospectors and others in or near the forests causes a needless property loss to Canada of from four to six million dollars. In this loss every citizen shares. It may be stated with truth that the Canadian people bear nine-tenths of the damage caused by forest conflagrations and that, therefore, he who does not seek at every turn to preserve our timber possessions from fire is playing false to his country.

Canada's power of recuperation after the war depends upon the productive state of her natural resources. A century of neglect has so reduced the timber supply that only the most careful husbanding will enable us to meet the needs of the future. When we realize that our forests are growing mainly where no other crop can thrive, and that ten trees fall by fire to one that falls by the axe of the lumberman, the cause of forest conservation is clearly identified with good citizenship.

A few practical hints may be adopted with valuable result: No camp fire should be built except among rocks or gravel, never in a bog, or in leaves, or evergreen needles. The camp fire should always be put dead out before leaving. Take no chances with a smouldering fire, but use a few extra pails of water or shovels of earth to make absolutely sure it is extinguished. Lighted tobacco or matches, carelessly thrown away in the forest, have started hundreds of bad fires.

By personal co-operation in this nation-wide programme of forest guarding, it is believed that the country's losses in this most easily-destructible resource will be greatly reduced and many human beings saved from death in forest fires."

# How U. S. deals with Settlers' Fires

*(From a letter of U. S. Forest Service to Canadian Forestry Assoc.)*

In the National Forest States of the United States fires have frequently occurred in the past caused by settlers burning brush and debris on lands being cleared by them, and considerable damage to National Forest timber has resulted in several instances. Such settlers' fires are often a grave menace to nearby Government and privately-owned timber lands. I am glad to state, however, that this menace to the timber in the western States is lessening each year, as the people, and especially the settlers themselves, realize the great danger involved in such brush burning in the dry season without adequate precautionary measures for keeping the fires under control.

The Federal Government relies largely upon the laws on this subject which have been passed by the legislatures of the respective States. Under those laws, the most general requirement throughout the country for the burning of brush, grass, and similar materials in or near woodlands for agricultural or pasturage purposes, is the one prescribing a closed season, corresponding to the fire danger season in the State, during which no burning is allowed. In some States burning may be done during the closed season if a written permit is first secured from a Fire Warden, or if the officer himself or his representative, is present. The period of the closed season varies considerably in the different States. In some it even covers the entire year, while in two of the States the township boards are empowered to declare a closed season whenever in their judgment there is danger of fire spreading. In one State the closed season restriction does not apply to the burning of log piles, stumps, or brush heaps, in small quantities, under adequate precautions and personal control, and if in accordance with regulations adopted by the board of forestry for that State; but if any such burning without permission results in the escape of fire and injury to the property of another, that fact is held to be *prima facie* evidence that the burning was not safe and was a violation of law.

Various other restrictions are also added in certain of the States, as, for instance:

(*a*) In one State the law prohibits the issuance of a permit until the dry snags, stubs, and dead trees over 25 feet in height within the area to be burned have been cut down, and such other work has been done on or around the area to prevent the spread of fire as may be required by the forest officers, who may also employ watchmen to supervise the fire until the permittee himself is able to control it.

(*b*) Another State issues, but does not require, a special permit giving certain directions for the proper care of the fire; to follow which is *prima facie* evidence that the permittee took proper and reasonable precautions to prevent the spread of fire.

(*c*) Other States, including some that have neither the closed season nor the permit provision, require the area immediately surrounding the fire to have previously been cleared or made safe so as to prevent the fire escaping.

(*d*) Notice to one's neighbors at specified periods, usually several days before burning, is provided for in a number of States.

(*e*) Watchmen to guard the fires when burning are required in certain other States.

In addition to criminal proceedings for causing the unlawful burning of woods, practically all of the States have made special provision also for civil liability and, in regard to those which have not, there is of course the usual common law right

to action for damages. Certain of the States allow the recovery of double the amount of damages suffered if the fire is caused through wilfulness or negligence, and one State provides also for liability for injury to young growth, the damage being calculated as the expense of artificially planting and cultivating the trees to the point of development at the time when the fire occurred. Other States make persons who cause fires liable for the cost of extinguishment, as well as for the amount of injury done.

---

As a result of the recent visit of Chief Engineer Nicholas J. Melnikoff, of the Russian Cabinet, to the United States and Canada, a renewed activity in the development of Russia is observed.

An exploitation company known as Russian-American Development Co., has been organized. M. Albert, formerly of Prince Rupert, British Columbia, of the firm of Albert & McKaffrey, Ltd., is en route to Moscow, via Vladivostok, to confer with Russian authorities regarding the establishment of a number of sawmills in Siberia to furnish material for the double tracking of the Trans-Siberian railway. It is stated by Mr. Albert that the Russian government contemplates building 4000 miles of railroad annually for the next 10 years. Mr. Albert, himself a Russian, states that the Russian-American Co. will make a preliminary investigation of the timber possibilities of Russia, and if conditions are favorable, will prosecute development, as the company has abundant capital.

---

Los Angeles was the first city in California to establish a vacation camp in the national forests. A tract of land in the Angeles forest has been rented, and a large camp built, costing about $8,000. This camp consists of a log and stone lodge, 46 furnished cottages, tennis and croquet courts, baseball grounds and handball courts. A ten-day trip can be made at a cost which is within the reach of practically everyone. By this means thousands of residents of the city have been able to spend their vacations in the mountains.

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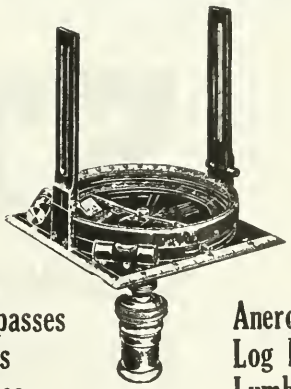

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The total removing of forest trees, from a country that is naturally wooded is a mistake from more than one point of view and is a sign of too much desire for immediate cash returns through cultivated crops, on the part of the farmers, without consideration for the future. There are few people that prefer a treeless stretch of country, as a place to live in but nearly all wish to have the benefit of the presence of trees within view, at the expense of a neighbor.

The planting of wind breaks is becoming more general in the North-West because farmers in that section recognize, at least, the comfort that results from such shelter, while those who take note of the results of such practice see that their crops benefit from the presence of the trees. Sheltering belts of trees are now needed in many parts of Eastern Canada, and in order to maintain comfortable and safe farming conditions the land owners should start planting as soon as possible.

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# *New Devices in Protective Work*

BY COERT DUBOIS,
*U. S. Forest Service*

About a year ago there came across my desk a newspaper clipping about a small wireless apparatus operated by the power generated by four dry batteries, invented by one Dr. H. Barringer Cox, of Bedford Hills, New York. On a chance I wrote Doctor Cox of our interest in a low-power wireless, described our communication problem in protection work, and asked him what he had. He, in turn, was so interested in the project of developing his invention in co-operation with forest protection work that he packed up and came out to California. He arrived last January, and established his laboratory and workshop on a canyon ranch in the Santa Barbara National Forest.

The essentials of Doctor Cox's system are what he calls the sending and receiving "loops:" these correspond to the aerials in wireless telegraphy, and, as finally worked out, consist of two 2-inch galvanized iron pipes about 30 feet high, set upright

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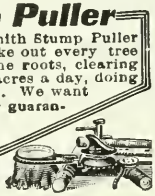

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about 60 feet apart, connected underground by an iron strip 6-inches wide buried to a depth of 18 inches. Above ground, the uprights are connected by an uninsulated No. 12 telephone wire broken in the middle by a bamboo insulator 18 inches long. His sending equipment consists of one to four ordinary Blue Bell batteries, a key, a coil, and six minute spark gaps arranged in two parallel series of three each. The receiving apparatus is an improved wireless detector and an ordinary head-set of telephone receivers. He has installed and experimented with stations one and a quarter miles, three miles, and thirteen miles away from his headquarters station. At the first two distances, telegraphic signals have been delivered. The 13-mile station was wrecked by range horses before it could be tried out.

The plan is to perfect, first, the cheapest efficient loop, then the coil and spark gaps for clear transmission to the determined loop at all distances up to 50 miles, with not to exceed two battery cells. Then to perfect the transmitter, which, with the same apparatus, will send the human voice.

When I visited the operations last April Doctor Cox was already sending telegraphic signals three miles with seven one-thousandths of a kilowatt.

Doctor Cox's principle is the inverse of the ordinary commercial wireless system. It uses the ground as the medium of transmission—not the air. To prove to himself that he was using what corresponds to the ground position of a regular grounded telephone circuit, he made some slight changes in his apparatus and telephoned successfully over a single wire with no ground.

*Reporting by Shots*

Reporting fires from lookout stations by shots has been frequently discussed as a possible method of communication, but until this summer I know of no actual tests having been made. The forest ranger on the division overlooked by the Fuego Vista Lookout Station on the Angeles National Forest, had trail work to do with a crew of men and was in consequence out of telephone communication. Arrangements were made whereby the lookout, on discovering a fire on which the ranger might be needed, was to discharge three sticks of dynamite, and the ranger was to "beat it" for the nearest 'phone. Two shots meant the fire was on the ranger's division. This system of communication was used on three occasions, and the shots were easily heard at an air line distance of three miles.

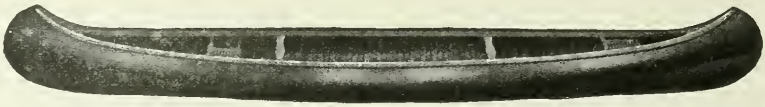
## PACKRATS DEVOUR PINES

On parts of the Angeles National Forest in California the packrats are so abundant that many of the young pines planted by the Forest Service have been killed or injured by the rodents. The damage seems to take place chiefly in the late summer and fall and is more extensive in dry than in wet seasons. It is thought that the rats tear off the tender bark of the trees to obtain moisture at times when water is scarce.

## HOW TREE PLANTING SUCCEEDS

Of the 22,000,000 trees planted on the Pennsylvania State Forests to January 1, 1917, over 15,000,000, or about seventy-two per cent. are now living. Over 11,000,00 of the 15,000,000 are white pine. Figures are not available on the present status of the private plantations, but up to the end of 1916 about 3,000,000 seedlings were planted by corporations and individuals, and at least 2,000.000 should be in good condition now.

*Are you a railroad employee*? The Forest Fire is doing its best to thin out your pay envelope. Deserts play traitor to freight and passenger traffic, and Forest Fires are the breeders of deserts. Forests when kept *alive* produce lumber mills, pulp and paper factories, busy towns, heavy tourist traffic, job for everybody. Five thousand forest industries look to you to keep their wood supplies fit for use.



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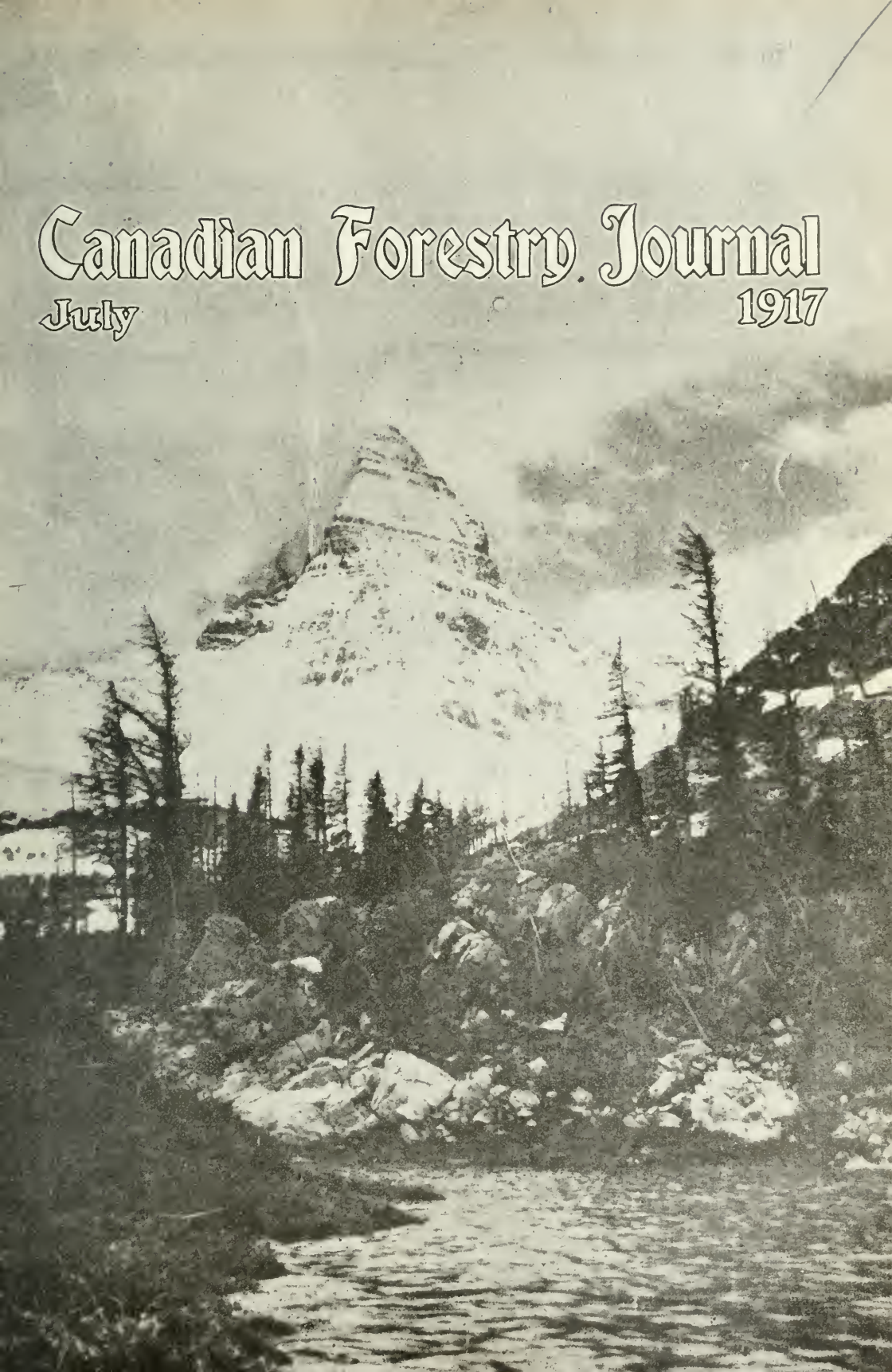

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SUGAR PINE ON THE WESTERN SLOPE OF THE SIERRAS IN CALIFORNIA

# Making Use of Aspen Poplar

By Dr. B. E. Fernow
*Dean, Faculty of Forestry, Univ. of Toronto*

## Present and Potential Ways of Utilizing Canada's Enormous Poplar Supplies

THE most ubiquitous tree in Canada is the Aspen poplar, also called quaking aspen and popple, there being two species (*Populus tremuloid* and *grandidentata*) which are, however, in looks, characteristics, and behavior so much alike, that they need not, for practical purposes, be distinguished.

**Not only is the aspen ubiquitous, i.e. found everywhere and in all kinds of situations from East to West, but, at least east of the Rocky Mountains it covers, we may assert, the largest area of any tree species and presents, perhaps, the largest volume of wood material of any one kind. This wide distribution gives to the aspen an economic importance which its wood quality would otherwise not impart to it.**

Its ubiquitousness is explained by the fact that it is an early and most prolific producer of light feathery seeds, which can be wafted by the winds in all directions for miles, sprouts quickly and grows quickly in full sunlight. In spite of these advantages in prolific seed production, ease of dissemination, and rapid growth, it would be a relatively rare tree if it were not for the forest fires, which create two conditions specially favorable to aspen life, a seed bed of mineral soil when the surface cover of vegetable matter has been burned off, and plenty of light. The aspen is what the forester calls a most "intolerant" species, i.e. intolerant of shade: it is light-needing and in competition with other, shadier species it soon succumbs; therefore, in the virgin forest it is rare.

The extent of aspen acreage is a measure of the carelessness of the people of Canada with fire, which by killing competing, especially coniferous, species and reducing the vegetable soil cover, creates these favorable conditions for it. Wherever fire has run through the loggers slash, aspen quickly takes possession as first comer; it is the balm for the sores which the fire fiend inflicts.

### *Protection for Conifers*

If seed trees of the coniferous kinds are left, given long enough time, these will re-establish themselves under the light shade of the aspen, which is advantageous to their development, and by and by will overtop and kill out the short-lived aspen. While, then, the recovery of the ground for the more valuable conifers can in most cases be readily accomplished, there are conditions, as in Manitoba, where dense shrub growth of various kinds, notably hazel and viburnum, comes in under the light shade of the aspen and effectually prevents the re-establishment of the spruce. The aspen then becomes a serious problem for the future re-establishment of the conifer crop.

For all these reasons the question of the commercial use of the aspen is an important economic problem. Here we encounter a further trouble in the fact that, before the aspen attains what may be considered merchantable log size, it is liable to white or black heart rot, the work of a fungus entering some broken branch or dead root and destroying the wood fiber, progressing from inside outward.

POPLAR IN SOUTH-EASTERN MANITOBA

This rot begins its work sometimes when the tree is not more than 20 years old, more frequently later, and increases gradually so that by the time the stand has reached log timber dimensions, say in 60 to 70 years, almost the entire wood body is penetrated by the mycelia of the fungus, rendering the wood unfit for known purposes. In a given case the United States Forest Service found in a 95-year-old stand nearly 60 per cent unmerchantable; in another case, an excellently appearing stand, the loss was nearly 50 per cent. In order to get the largest amount of sound wood the trees should be cut before the fungus has made much headway, say in the 40th to 60th year, according to conditions, or 50 years on the average, when the diameter will average 8 to 10 and up to 15 inches in better soils, and from 30 to 40 cords per acre may often be found.

### *How Poplar is Used*

The wood decays as easily in contact with the soil as the tree itself, otherwise it is fit for use wherever a light soft and not strong material is serviceable. Locally, to be sure, it is used in the absence of better material for many purposes, and cut in large quantities for fuel, for which it is inferior, although for baking its quick, hot fire is advantageous. Commercially, it is used for the manufacture of excelsior, certain kinds of cooperage, especial y nail kegs; crates, baskets, berry boxes, spools, and more prominently for paper pulp, for which it is, perhaps, best adapted.

As regards the latter use, it is to be noted that it is specially fit for the soda process, that by itself it makes a weak paper, lacking in satisfactory matting quality, and is therefore customarily used in mixture with spruce pulp, when it makes an excellent book paper.

### *For Paper Making*

In the United States more aspen is used for paper-making than any other wood except spruce and hemlock. In 1909, the proportion of aspen used in paper manufacture was 6 per cent. of the total pulpwood consumed, or around 250,000 cords, of which 25,000 cords came from Canada. In 1910, the consumption had grown to 360,000 cords, or 9 per cent. of the total pulpwood consumption, and the importation to 45,000 cords.

# The Raid on Spruce-Filled Homesteads

## Present High Prices for Pulpwood Have Revived False 'Land Hunger'

UNTIL homesteading and timber licensing are completely removed from the vicious influence of political pull, various administrations will continue to play ducks and drakes with the public resources of land and timber.

In violence to the legal regulations and every consideration of the public good hundreds of 'homesteading' applications are granted because of political pressure and only the lack of publicity for such transactions can prevent a general protest.

None denies the right of a land-hungry citizen applying to his Government for a free grant. But in these days when spruce for pulpwood commands the high price of eight dollars a cord delivered at the railroad, it is significant how many persons are getting 'land hungry' and cannot be persuaded to take land that is not densely covered with pulp wood. Offer most of the appli-

A STAND OF ASPEN ON RIDING MOUNTAIN RESERVE, MANITOBA.

cants a homestead of cleared land, ready for the plow, and they would turn it down.

*A Menace in the East*

It is understood that the Lands Department of the Government of New Brunswick is overloaded with "homestead" applications. Traditional practice in some parts of the Dominion has granted these requests as freely as they arrived. So-called settlers seeking some cheap and accessible timber, when the market is thriving, are allowed to take these generous slices out of a licensed area. Indifferent to the effects of fire, careless as to the fate of the main stand, they form one of the most dangerous menaces with which the protective staffs have to do. Often the spruce lands are quite unfit for agriculture nor has the settler in many instances any intention to try a permanent residence. He clean cuts the standing timber, leaves no provision for natural reproduction of trees, creates a fire hazard, and finally moves off with some easy money.

*When the Special Interest Enters*

There are indeed many cases where permanent colonies have followed the settlement of such tree-covered lands but in all too many attempts, political pressure has compelled the giving of non-agricultural lands to men who are petty speculators and nothing else. They pay no timber taxes, observe no regulations and increase greatly the fire peril. Their interest is transient, and antagonistic to every consideration of the public interest. Not infrequently their applications are promoted by special interests concerned in the founding of a colony. It is the opinion of the Forestry Journal that these 'interests' are mistaken, no doubt honestly, in their purposes. They desire a permanent settlement, whereas the attractive crop of spruce is turned to quick account and the non-agricultural soil beneath as often as not will refuse to give a farmer a decent living. Such colonies are fated to live in penury after the first sudden harvest of easy money on the wood and will prove an eventual liability to any province that permits their development.

*Community Life Essential*

The straight-forward policy for any honest government is to refuse homesteading applications except for land definitely proven as agricultural and where it lies in sufficient volume to maintain a community and its social machinery. No citizen ought to be allowed to locate himself and family in a mere 'pocket' of good soil, isolated from schools, churches, and markets. Where applicants can be shown to be mere timber grafters, their cases should receive short shrift.

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# *The Moving Forests of Alaska*

Trees flourishing on moving glaciers is one of the curious sights presented to visitors in Alaska. Dr. B. E. Fernow, dean of the Toronto Forest School, was a member of the E. H. Harriman expedition of scientists to Alaska and made the following references:

Among "interesting observattion on local distribution and the relation of tree growth to soil" is noted "the presence of trees in close proximity to some of the great glaciers, showing an astonishing indifference to the influence of nearby ice masses. Not only do the trees, whenever soil conditions permit, grow close to the icy river, attaining as a measurement within 100 yards of LaeProuse Glacier showed; diameters of 5 feet and

heights of 150 feet, but in places they even encroach upon the icy field, when this has come to rest and has a scanty cover of soil from the moraine material, upon which vegetation can establish itself. Thus, at the foot of Lucia Glacier, on Yakutat Bay, the stream which runs in a wild torrent from the glacier, has cut a veritable canyon through the ice, exposing an ice bank 100 feet high. This ice is over laid with moraine material a foot or more in depth, and this is sufficient to support a dense cover, not only of herbaceous but of woody vegetation, a thicket of the ever present alder, with occasional willows, and even spruce do not find the substratum too cold. As the ice melts at the border, the soil and its occupants may be seen from time to time tumbling down into the stream, or else into the deep potholes with which we find the ice plateau amply provided."

In his "Travels in Alaska" John Muir describes a garden of flowering plants and seeding trees growing on the Stickeen Glacier.

# *German Trick to Ruin French Orchards*

Thanks to the genius of the French race, it is hoped that large numbers of the fruit trees which the Germans did their best to destroy, and in many cases succeeded in destroying, may be saved. Mr. Henry Wood, the special correspondent of the United Press of America with the French Armies, tells in a despatch how this 'miracle' has been wrought. Throughout the entire district devastated there were thousands of trees that the close pursuit of the French prevented the Germans from cutting down completely. Instead the kultured tree-killers cut off a circle of bark which, with a few days' exposure to the sun would have been enough to kill them.

These trees presented the easiest problem. The wounds were bound up by thousands of army surgeons, and Red Cross ambulance drivers and stretcher carriers assisted. The circle was first covered with a special grafting cement, and the entire wound then carefully bandaged, often with bandages prepared for human limbs. Tar was used for the work, and finally even a loamy clay. In the end it was found that moss, twisted and tied about the dressed wound, was as effective as anything else. A much more serious problem presented itself where the trees had been cut down. But here French genius also solved the problem. The stumps, protruding usually two or three feet from the ground, were first trimmed off so as to conserve the sap. This stump was then treated with the grafting paste and carefully bandaged till the tree lying at the side budded from the sap that remained after being cut down. Branches that showed great numbers of buds were then cut off and grafted into the prepared stump. To-day these grafts are in full leaf and blossom, and years have been saved in restoring the cut-down orchards.

## WANTED—ASH AND HICKORY TIMBER LIMITS

An important British company are considering the possibility of erecting a factory in Canada for the manufacture of ash boat oars and hickory dimension stock. They would require at least three million (3,000,000) feet of ash per annum before they would be warranted in putting up a factory to manufacture the ash boat oars for which they have a market. They would also require large supplies of hickory. If hickory and ash are not obtainable together they might possibly consider the establishment of factories in two localities. Owners of timber areas containing sufficient supplies of ash or hickory or both might communicate with the Commercial Intelligence Branch of the Department of Trade and Commerce, Ottawa, referring to file No. 15782.

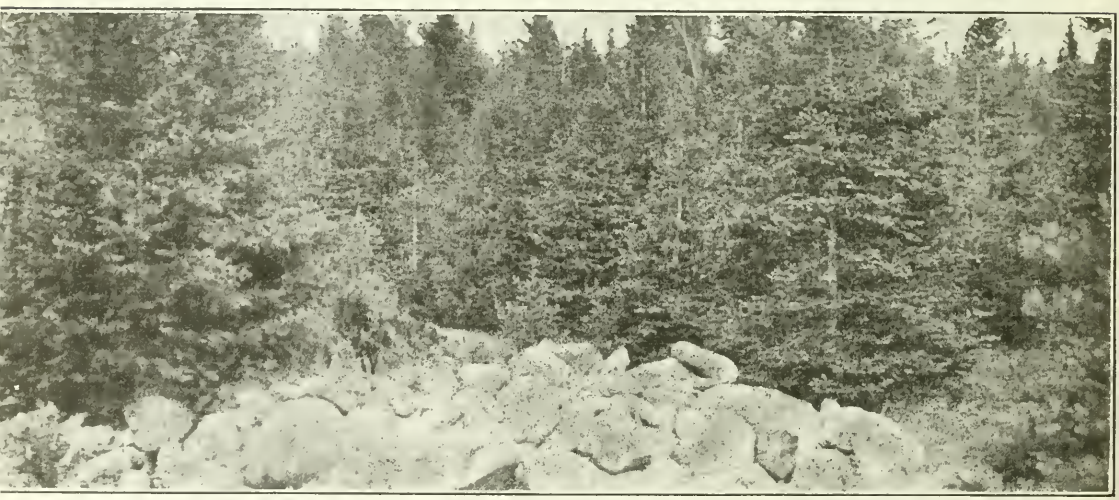
# New Brunswick's Foundation—The Forest

## No Other Province Bases Existence So Completely Upon Living Forests

PROBABLY no province in Canada is so thoroughly identified with forest industries as New Brunswick. Southern Ontario, for example, is a land of farms and industrial towns, continuously tending towards specialization and more and more remote from lumbering. Southern Saskatchewan has to do with wheat and stock raising, usually carried on as exclusive undertakings. But New Brunswick, with its relatively sparse population of 351,000 (1910 census) presents the interesting characteristic of multiple employment, where most male residents outside of the larger towns draw part of their income more or less directly from woods operations. The winter wages in the lumber camps for men and teams, the millions of dollars disbursed by the mills, account in no small degree for the happy average of prosperity which has characterized the province for a great many years.

### *Arousing Public Interest*

The Secretary of the Canadian Forestry Association recently held nine public meetings in New Brunswick, at Moncton (auspices of the Canadian Club); Chatham; Millerton, Boisetown, Doaktown, Blackville, Renous, Tabusintac, and Bay du Vin. Through the kind assistance of Mr. W. B. Snowball, a director of the Association, the meetings secured due publicity, and the attendance, even on uncomfortably warm evenings, was splendid. The audiences in most places were composed of lumbermen, timber scalers, farmers, fishermen local teachers, clergy, etc. so that over two thousand men and women were encountered in this brief series of illustrated lectures. The addresses told of the contribution of the forest endowment to prac-



THE FINAL RESULT OF OPENING POOR STONEY LAND FOR SETTLEMENT.
View taken at Hazleton Settlement, South West Miramichi, New Brunswick.

AN EXAMPLE OF PREVENTABLE WASTE OF NEW BRUNSWICK'S FORESTS. THE STUMP OUGHT TO HAVE BEEN NO HIGHER THAN THE LINE INDICATED BY FOREST OFFICER.

tically every line of employment. The story of Canada's forests from the days of the French Governors was recounted, with attention to the gradual development of public policies of conservation. Emphasis was given to the primary interest of the state in forest protection and its responsibility to make the foundations of wood-using industries solid for all time to come, to guard the natural resources as a trust for coming generations, and maintain the chief source of provincial revenues. The audiences were much interested in new discoveries and applications in the use of wood, in-as-much as they assured any province, well stocked with wood supplies and water powers, numerous other industries utilizing the tree for new purposes and turning to profitable use what to-day the lumber and pulp industries regard as waste. The progress of other countries in forest management was touched upon, and modern meth-

ods of fire patrol and fire fighting were described. Attention was given to the New Brunswick Forest Survey and Land Classification, explaining its purposes and present progress. The speaker found the Survey project to be very largely misunderstood. Occasion was taken to strongly advocate the creation of a Provincial Forest Service, directed by technically qualified foresters, having charge of the fire-ranging work and, what was quite as important, having authority to supervise logging operations to see that Crown Lands regulations are properly observed. The meetings were marked by excellent order and a new series of gatherings ought to follow next fall.

*What Should Follow!*

New Brunswick's wisdom in undertaking an inventory of its forest resources is unquestioned. By the information obtained the province will have scientific guidance not only in placing apart non-agricultural soils as permanent timber reserves, but in directing future settlement away from impossible locations. Logically there should follow, and without longer delay, the establishing of a Provincial Forest Branch, similar to that of British Columbia, whereby the administration's responsibility for the condition of the forest lands may have some means of practical action. Qualified foresters versed in New Brunswick's own conditions and working co-operatively with all progressive lumbermen ought to have a general oversight of logging operations so as to reduce the heavy waste that now obtains. This plan invites co-operation of every limitholder who has an honest desire to keep his limits in productive condition, and would result in an all-round profit to province and operator. Few licensees would deny that New Brunswick cannot hope to hold its pace in lumber production while the source of the raw materials is running down hill by unregulated logging. Obviously, the fire protection work would come under the proposed Forest Service and in all probability a new system of ranger management put in operation.

# *Fifty-Six Forestry Companies for France*

The following report of the work of the Canadian Forestry Corps has been received by the Canadian Government from general headquarters in France:

There are at present 22 companies of the Canadian Forestry Corps operating in France. The first eight companies arrived between December last and the end of March, and five companies arrived in April, with their full technical equipment and approximately 60 per cent. of their transport. Eight more companies arrived in the third week in May. It is hoped to employ 56 companies in all by September.

The companies are equipped with Canadian made saw milling machinery and tools, and the greatest efficiency and keenness is displayed by all ranks. Operations extend over a large area.

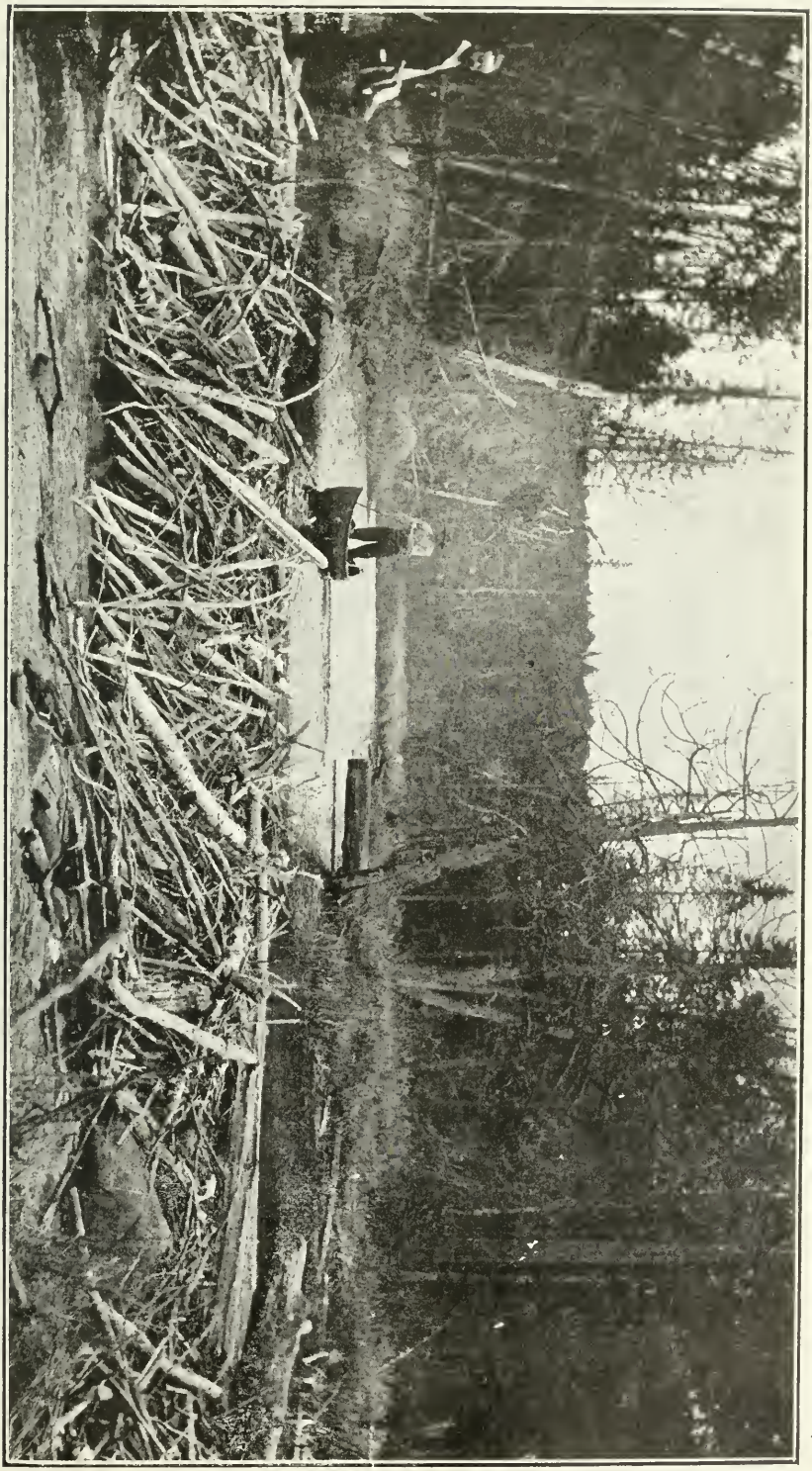
All species of lumber are manufactured, including sawn timber, sleepers, trench-timber, pit-props for roads and mining.

The establishment of the companies, including transport, is 190 all ranks. The average production varies according to the nature of the woods. In suitable woods between 1,000 and 1,500 tons of sawn lumber, together with sufficient round timber to bring the out-put up to 2,000 tons per month, may be expected. On round timber alone, however, a company produces about 4,000 to 6,000 tons per month.

*Working Under Fire*

Some of the operations of the Corps are being carried out under shell fire, and one unit was recently

(*Continued on page 1203*)



A BEAVER DAM IN ALGONQUIN PARK, ONTARIO.

(Courtesy Canadian Northern Railway.)

# About the Common Crow

By Norman Criddle,
*Dominion Entomological Laboratory, Treesbank, Man.*

THERE is probably no bird that has been more generally condemned by the public than the crow and I have little doubt that fully ninety people out of every hundred would subscribe to such an opinion, fully believing themselves to be right. This, I think, is largely due to the fact that its misdeeds are mostly of a prominent nature and easily observed, while its benefits pass unnoticed. Thus a crow carrying off a young bird is apt to attract attention; there will be the cries of the parents or perhaps the nestlings are known, whereas the same crow might pick up thousands of noxious insects without any one being any the wiser; indeed its presence would probably lead to its being accused of some fresh atrocity. And so, no matter how a nest is ravaged—be the offender cat, dog, coyote, skunk, squirrel or hawk—if there is a crow in the neighborhood he is the thief without doubt, and another cry goes up about his iniquities.

There is another point that is either overlooked or ignored by those condemning crows. As I have pointed out above, these birds make a practice of watching mankind, being probably on the look out for food. Thus a man visiting another bird's nest is more often than not seen by a crow, moreover, he disturbs the brooding bird in broad daylight. Thus, there is every chance of the crow discovering the nest. Compare these artificial conditions with natural ones and we see at once, that they are totally dissimilar. An excellent illustration of this has been supplied by a violent anti-crow advocate from whose statement the following is taken: "I have watched Mr. Crow for many springs and I find him getting more and more numerous and hungry every year. I have found prairie chickens and grouse nests and *marked them to keep watch* and found that the crow got two out of every three before hatching." He goes on to speak of a blue-jay's nest. "I watched and passed this nest two or three times every day. When almost ready for hatching I heard a great commotion in Jayville and found the nest robbed by Mr. Crow." The italics are mine. Almost all the arguments as to crow habits follow this line of reasoning.

### *The Injury Done by Crows*

In Eastern Canada and throughout the corn belt of the United States the chief complaint against crows is that they destroy much sprouting corn for which they soon acquire a taste, thus not only causing severe loss, but necessitating the treatment of the seed with a tar preparation as a deterrent. In Western Canada, however, we have not as yet suffered to any appreciable extent from injury of this nature, due doubtless to the comparatively small amount of corn grown. With reference to the destruction of other cereals, this is chiefly confined to grain in the stock when large flocks of crows make a habit of visiting certain fields daily. The injury, however, is not usually as severe as might be expected, owing to the fact that the birds really pick up a large proportion of insects.

### *The Value of Crows*

It is common knowledge to every farmer that crows are constantly in attendance behind the plough, cultivator or harrow, not, as has been claimed, to pick up the seeds, but to feed upon the various larvae such as cutworms, wireworms, and white grubs that are exposed, especially the last two pests. I have seen white grubs in heavily infested fields

reduced more than fifty per cent by the aid of crows, and as these grubs are almost impossible to destroy in other ways, the value of crows in this respect is of considerable importance. Cutworms are also located among the growing crops and eaten in large numbers. Indeed to observe a flock of crows constantly returning to the same area in a field is strong evidence that there are cutworms or some other noxious insect present. A remarkable example of how crows sometimes aid farmers was witnessed near Treesbank, Manitoba, in September, 1915. There was a destructive outbreak of army-worms at this time, which having eaten all the available vegetation in the close vicinity were marching over a roadway in enormous numbers to attack a field of oats. Here it was that the crows found them and soon caused a very appreciable reduction in their numbers. This flock of crows which was estimated at 3000, had previously been frequenting a locust-infested area which they speedily forsook for the more palatable army-worms, with which they remained until these larvae pupated and even then many pupae were located beneath clods of earth and devoured. It is interesting to know that in this instance the crows were at first actually suspected of some mischief by the farmer chiefly concerned, though later when their real object was pointed out this farmer could not say too much in favor of the crows. Apart from their value as destroyers of noxious insects, crows also kill mice and young rabbits. Add to these their habit of devouring offensive carrion and we have reviewed the chief points of the birds' usefulness.

# *Mankind's Debt to Entomology*

*Extract from a Paper Presented at the Reading Meeting of the Pennsylvania Forestry Association*

Entomology has always been a stepchild in the economy of our civilization. Its true values have not been recognized for ages, and even to-day it receives but scant appreciation from the public and the authorities, while her sister sciences are nursed and pampered with jealous care. But Entomology has wedged its way from obscurity to prominence, and plays to-day an important part in shaping directly or indirectly all phases of our economic life, whether generally conceded or not.

Let us go back to remote ages and review briefly the history of this interesting study. At a time when the human hand and mind were not employed in searching for a system to establish the relation between natural objects, we can only expect disconnected utterings either in writing or by picture. Thus we find in the early Chinese and Japanese history mention made of insects which benefitted them—such as the silk moth and honey bee. Butterflies often appeared in early Chinese ceramic art. The early Egyptians (about 1500 B.C. and centuries before) went so far as to hold a beetle in religious veneration.

The ravages of the Black Death or Plague in the Middle Ages, now known as being caused by bacilli transmitted by fleas, which in turn are carried by rats, have claimed victims by the millions. In the year 542 A.D. an outbreak occurred in Egypt, which spread all along the Mediterranean to Europe and Asia. It lasted 60 years and caused the death of many millions of people. In the year 1364, another outbreak of Plague spread over the whole then known world, and the mortality is estimated at about 25 million people.

There are many instances in which the all pervading ignorance on entomological matters in these days is

overshadowed by glaring superstition. Turning to the pages of Frank Cowan's "Curious History of Insects," we find dotted all through history records of "Showers of blood."

Homer, Ovid and Livius speak of them, and during the Middle Ages no explanation was given as to how red drops could fall from the sky so numerous as to appear like raid. We know that certain butterflies, especially of the genera Vanessa and Grapta, after emerging from the pupa, void their body of a reddish liquid, which when the insects are numerous enough, would give the appearance of "red raid." In the annals of England we find two such accounts of showers of blood, and there are many accounts from the European Co - tinent. In the year 1296, in Frankfort, one of these showers led to a massacre of the Jews, in which 10,000 people lost their lives.

# *Beetles Damaging Yellow Pine*

To British Columbia readers of the Journal who have noted the damage to Western yellow pine the following letter from the Entomological Branch to a Vancouver lumber firm will prove interesting.

We have received from the Canadian Forestry Association, a quotation from your letter referring to the injury to yellow pine in the Okanagan and Similkameen valleys. This injury has been caused by bark-beetles, particularly by the western white pine bark-beetle and the western pine bark beetle. The injury in British Columbia has been very carefully investigated and our bulletin No. 7 sent you under separate cover deals with the matter in detail. The injury has been very greatly extended since the bulletin was written and has assumed very serious proportions. During the latter part of the summer I hope to make a further examination of the extent of the injury and the rapidity of its spread during the last two years. All companies having limits in the yellow pine country should take immediate interest in the spread of this destructive pest and take every precaution to protect their limits from serious infestation. A limit that is being logged can be protected without great expense.

We shall be glad to receive any reports of forest insect injuries that come under your notice.

Signed by J. M. Swaine,

In charge of Forest Insect Investigation.

## GOLD CAMP IN PERIL

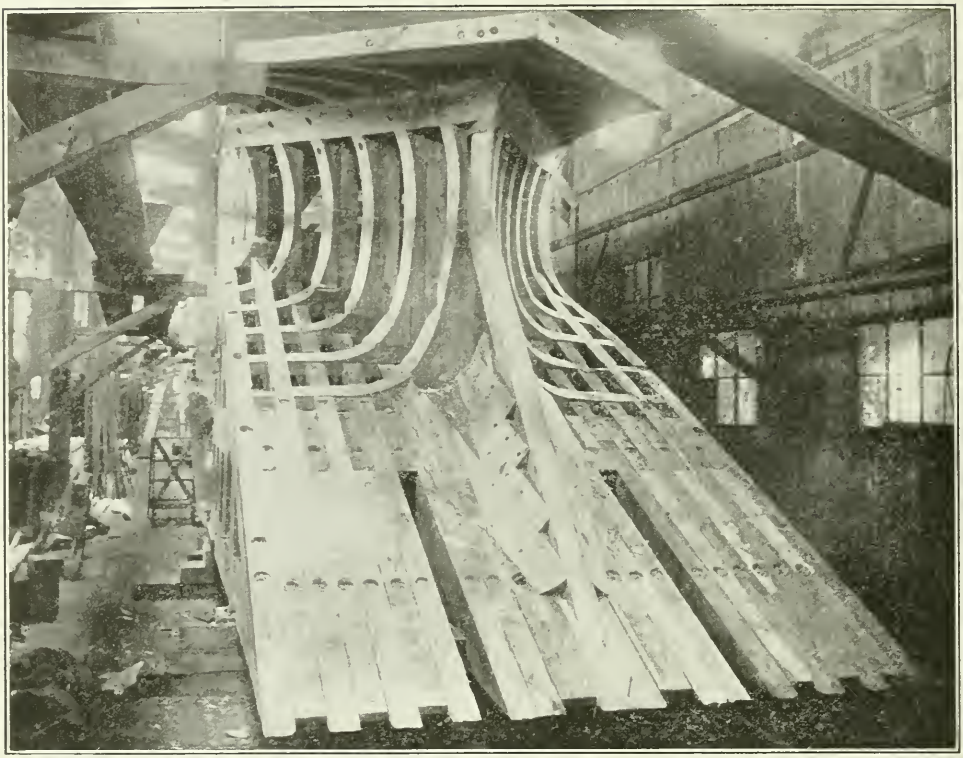
Tashota, the newest Ontario gold camp, had a nerve-racking experience during the late dry spell, says the Toronto Mail and Empire. The country is densely wooded, the small settlement clustered about the railway station being but a speck in the ocean of forest surrounding it. May was dry, and the early days of June found the whole countryside parched and fit to feed the flames once a fire should be started. Finally, what all men had feared came to pass; the whole district was full of smoke and fire, and the skies were as brass.

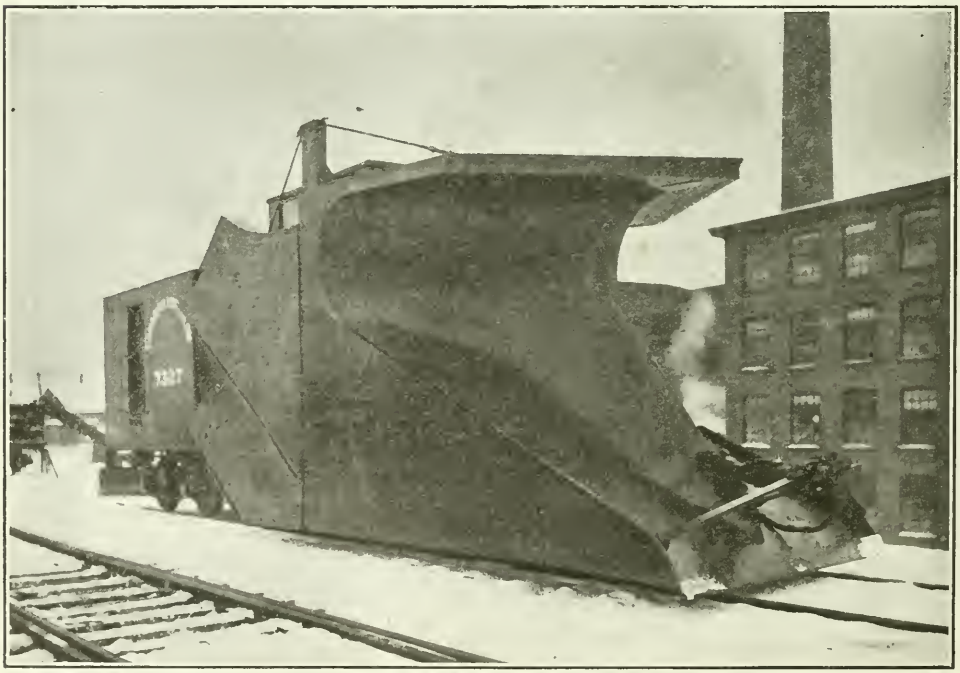
Nearer and ever nearer crept the burning, until it seemed that Tashota was doomed to the fate of Porcupine. An urgent message was sent to the officials of the N.T.R., and in response a train was made up and sent to the settlement. Into it all the worldly belongings of the miners and railway officials were packed, the women were put on board, and steam kept up, so that an immediate retreat might be made should one become necessary.

Then, just as the outskirts of the clearing had been reached by the flames, the flood came down; furniture and belongings were hastily unloaded, and the settlement returned to normal life and could once more breathe freely.

DEFEND YOUR COUNTRY
FOREST
FIRES
FIRES THIS YEAR WILL COST US
MEN, HOMES AND RESOURCES
TAKE NO CHANCES
WITH CAMP FIRES
MATCHES, CIGARETTES, OR SLASHINGS
PUT THEM OUT
WESTERN FORESTRY AND CONSERVATION ASSOCIATION
DESIGNED BY
WESTERN FORESTRY & CONSERVATION ASSN.

# *How Snow Plows are Built*





Showing the amount of wood construction visible in a Railway Snow Plow before the steel shield goes on. Photographs by courtesy of the Canada Car and Foundry Co., Amherst, N.S.

# Edmonton Board of Trade Favors Better Forest Management

## Province and Dominion Should Join Hands in Eliminating Fire

At a luncheon of the Edmonton Board of Trade at which the Secretary of the Canadian Forestry Association gave an address on Forest Conservation as related to the prairie provinces, a special committee was appointed to bring in a report on Alberta's forest conservation needs. The members were James McGeorge, G. E. Hayward, and William Short. After investigation the following report was delivered to the Board and adopted, a copy being forwarded to the Minister of the Interior:

Your committee having considered the matter reports as follows:—

In the Province of Alberta within comparatively recent time there was approximately 100,000 square miles covered by merchantable timber now mostly destroyed by fire. Of that area a very large proportion as to soil and climate is not suitable for farming —particular reference is made to the Eastern slope of the mountains and to the more hilly and broken section in the North of the Province, where as to plant life, timber is the only effective crop.

If fire were kept out and even if slight effort to that end were made in thirty years this area would reforest to the extent that there would begin to be a large output of merchantable timber, and in fifty years this area would become an exporter of timber beyond what is required on the prairies.

The ownership of the timber is retained by the Dominion; the interest of the Province is that land suitable for agricultural purposes is not diverted to reforestation. Therefore to prevent trouble on this head there ought to be joint action on the part of both Governments to determine what land is suitable only for timber. If that be not done, and protection be not afforded, fires will continue to destroy the only growth of which this land is capable, and settlers will continue to settle upon land which is not suitable for farming, and will thus waste their own energies and add nothing to the wealth of the Province.

Examination by the two Governments and setting apart for reforestation of lands found suitable only for timber would prevent this useless waste of effort, and settlers would the more readily abstain from seeking such lands, if after competent examination, they were set apart for timber purposes. As the growth of timber on the area suitable for no other purpose would by the bounty of nature alone add enormously to our wealth—the added cost of protection being a mere bagatelle.

It is therefore respectfully recommended:—

1. That a survey be undertaken by the Dominion and Provincial Governments jointly to determine
   - (*a*) Timber lands.
   - (*b*) Grazing lands.
   - (*c*) Farming lands.

2. The areas found suitable only for timber growing should be set apart as a timber reserve and reforestation promoted thereon.

3. Roads should be constructed through this timber area with cross roads at intervals to permit of an effective patrol. Along the Eastern slope of the mountains it is suggested that there should be roads running East and West every ten or twelve miles, with cross roads at intervals. These should follow the line of least resistance, and for the most part would need no more than that the

earth be levelled sufficiently to permit the proper ranging of the territory.

4. As far as possible prison labor should be employed in the construction of these roads.

5. A corps of forest rangers should be employed to patrol this timber area using therein

(*a*) Indians.

(*b*) Farmers or stock raisers who would be allowed to settle on grazing areas within the reserve.

(*c*) Specially trained rangers who should be charged with the duty of reforesting.

6. Allowing fires to escape should be rigidly punished. In this connection the recent Manitoba Act for prevention of fires is not at all severe.

7. The reforesting and reproduction of timber in this area should be set about as patiently and scientifically as is being done in Europe, and the settlers of the Province thoroughly advised of the purpose and necessity and advantage of this being done, so as to secure their cordial co-operation.

# *Summer Resorts Aid Forest Protection*

Most of the larger summer resorts of Canada were asked early in June by the Canadian Forestry Association to urge upon their guests by various means greater care with fire in the woods. The response from summer resort managers has been remarkably good and on the menu cards and advertising literature of many hotels can now be seen warnings regarding forest fires. Many most valuable suggestions for the extension of this plan in the summer resort districts were made to the Association but these cannot be carried out at present for lack of means. Some of the mottoes submitted to the hotel managers were as follows:—

"Do not throw away lighted matches or tobacco in or near the woods. Bush fires spoil the fun for the next man.

"Most of the damaging fires in the woods are set by human hands. Watch yours.

"This resort needs the trees. Play careful with your matches and lighted tobacco when walking through the woods. Never leave a camp fire unextinguished.

"Make this a year of thrift in forest fires. Thrift starts in the head but works through the finger tips. Careless finger tips toss away lighted matches and tobacco. That's how the big fires start.

"Guests are requested to practice every care in keeping the woods in this neighborhood free from fire damage.

"Only the amateur neglects to extinguish his camp fire in the woods."

## FIRST SCHOONER OF FLEET

On another page is an illustration of the motor-driven five-masted schooner "Mabel Brown," launched by the H. W. Brown Company, Ltd., Vancouver, B.C., who constructed the vessel. The "Mabel Brown" is now on its way to Sydney, Australia, with a cargo of 1,534,000 feet of lumber for the Government of New South Wales. The vessel is built throughout of British Columbia Douglas fir. She took on her load in ten days at the plant of the Victoria Lumber and Manufacturing Company, Limited, Chemainus, B.C., and will occupy about 45 days in reaching Sydney. The freight charges on her cargo amount to $45,000. The "Mabel Brown" is the first of many similar vessels which are now being built in Canada, to take the water. She is equipped with two 160 h.p. engines of the Diesel type.

**NOTICE**

**The Canadian Forestry Association would be pleased to receive copies of the April, 1915, issue of the Canadian Forestry Journal. These are urgently wanted.**

# *First War-Time Schooner from B.C. Yards*

(Courtesy "Canada Lumberman")

**Auxiliary schooner "Mabel Brown," in Burrard Inlet, running under flying jib, outer jib, inner jib, fore-topmost, staysail, mainsail, mizzen, spanker and driver.**

# Soil Surveys in Nova Scotia

By L. C. Harlow, B.S.C., B.S.A.,
*Chemist, Agricultural College, Truro*

NOVA Scotia has frequently been surveyed. Every railroad which has been projected was preceded by the surveyor who measured, studied and mapped every detail of the proposed course. The geologist has examined the rocks, noting the kind, extent and outcrops, and has put his observations into a geological map which shows rocks characteristic of many geological periods.

The miner has dotted our maps with various marks to show where the gold, copper and other economic minerals may be found.

Again the, lumberman has had expert foresters make a map to show the details concerning the hardwood softwood and barren land of the various counties of the province.

All these are valuable guides for anyone preparing to start mining or lumbering in any locality or in indicating our resources.

It is only reasonable that the farmer, who must, to quite an extent, depend upon what the soil can give him. should have some quite exact information regarding the soil of his farm. The stranger in selecting a farm, should, among other factors, be guided by the type of soil peculiar to that locality. The son who inherits the homestead should know as near as possible the amount of plant food in every acre of the farm.

This information a soil survey should provide; it should also furnish information regarding the physical condition of the soil, the water supply, drainage and all facts necessary to enable a person to select a farm adapted to any particular type of farming.

The results of such study in the United States are now being put into elaborate maps. There the soil chemist, the surveyor and the soil physicist of the Department of Agriculture at Washington, and the State Department co-operate. No such extensive plan of work as this has been attempted in Nova Scotia.

## *Lumbermen's Sons at Vimy Ridge*

Perry Robinson, war correspondent with the British headquarters in France, has paid a tribute to the lumbermen's sons who fell at the great Canadian victory at Vimy Ridge. He says:—

"On the summit of Vimy Ridge there is a little group of white-painted wooden crosses, marking the graves of the Seaforth Highlanders of Canada, who fell in the capture of the ridge. These Canadian Seaforths were mostly British Columbians. A long, long way they came to die, the long-limbed sons of Victoria, Vancouver, New Westminster and Nanaimo. Some came even farther, for they came from the far off slopes and peaks of the mountains of the upper waters of the Fraser River, when they heard the call."

"There could be no prouder burial place than this ridge which they won so splendidly.

"One knowing the British Columbia of bygone days, stops to look at these graves. It is the old British Columbia that leaps to mind with its great reaches of unbroken forest. If one had his way he would plant this Vimy Ridge with trees, brought from British Columbia, and let these men, when the present wooden crosses are replaced by a noble and permanent monument, rest under the shadow of a grove of their own pines, firs and cedars."

# A Cheap Method of Snow Removal

A very important part of the work of the U. S. Forest Service is replanting the burned-over and denuded lands which are contained in the 152 National Forests. About 12,000 acres of these lands are reforested every year and in order to supply the necessary planting stock twenty-one nurseries with a total capacity of more than 37 million young trees are maintained.

The majority of these nurseries are located in mountain valleys of the West where the climate is exceedingly rigorous. During the winter, when the thermometer drops far below zero and the snow piles up to a considerable depth, all operations have to be practically suspended.

In some places this heavy snowfall is a rather serious hindrance to early spring planting, since it often happens that the higher bare slopes, where the planting is to be done, are exposed to the sun and warm winds, and are bare of snow long before the vall ys in which the nurseries are located. On this account, it frequently happens that the snow has to be removed from the nursery beds in order that the planting may be done at the most advantageous time. Wit two or three feet of snow, this is something of a job and entails a considerable expenditure of both money and valuable time.

**At the Beaver Creek Nursery, on the Wasatch National Forest, in Utah, which has a capacity of 750,000 plants, it was found that by sowing finely pulverized dirt over the snow the melting was so hastened that shoveling was unnecessary. The first experiments were so satisfactory that they were continued and have been adopted as the official snow removal method.**

Each fall sufficient supplies of fine dark soil are stored at the nurseries for use the following spring. At the same time the beds of stock to be used for planting are marked by long stakes in order that they may be easily identified. About two or three weeks before the stock is needed the soil is sown on the top of the snow, just as grain is sown. Hand sleds are used to transport the bulk of the supply, from which a bag slung from the worker's shoulder is filled as needed. By this method one man can remove from three to six feet of compacted snow by one day's work if done sufficiently far in advance. Many commercial nurserymen will doubtless be able to employ this simple practice to uncover stock needed for early planting, or to prevent losses from fungi which work under deep snow late in spring.

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### Fifty-Six Forestry Co's for France

(*Continued from page 1192*)

heavily shelled, fortunately no casualties resulting.

Of these companies six are employed in the army areas although their work is greatly handicapped by having to operate in small woods, as a rule devastated by shell fire. The daily output is most satisfactory and wood is delivered direct to armies at very short notice.

Companies, including the Canadian Construction Company (colored) are employed in the Jura Wood The Canadian mills in operation in this area have aroused great interest amongst the French military and civil authorities who have not hesitated to express their admiration of the mechanical efficiency evidenced in the design and construction of the mills.

Ten companies are now working on the lines of communication. Some fine forests have recently been acquired for exploitation in this area.

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In 1914-15, Canada imported for structural purposes, southern pine valued at $1,608,788.

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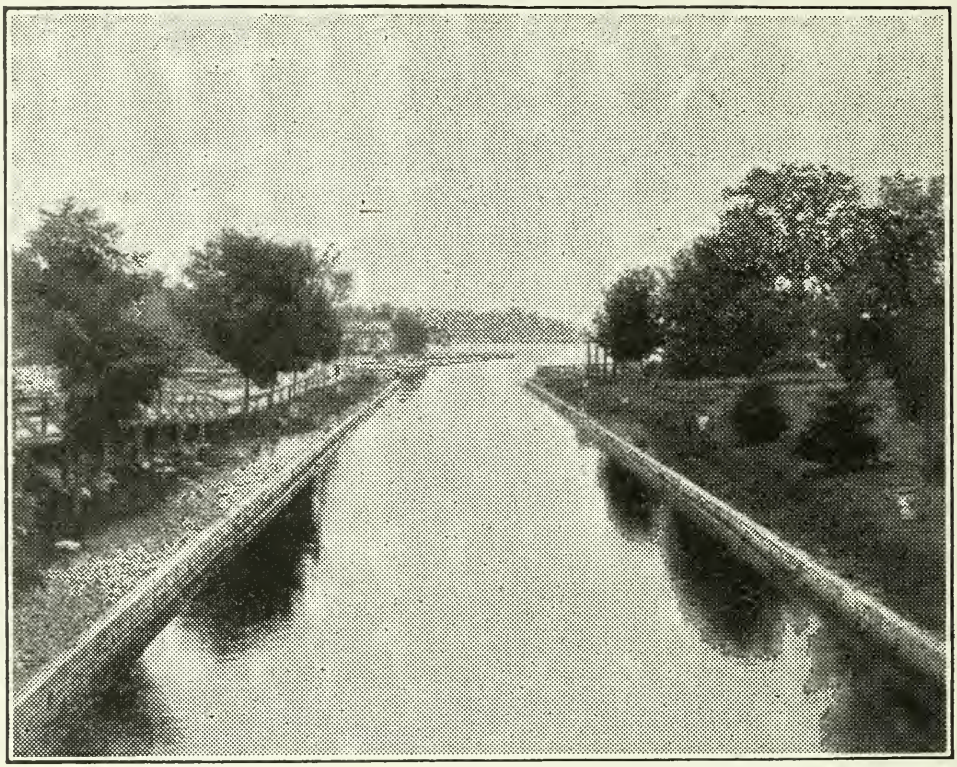
Douglas fir timber, 46 by 46 inches square and 70 feet long, is used in Montreal for harbor work.



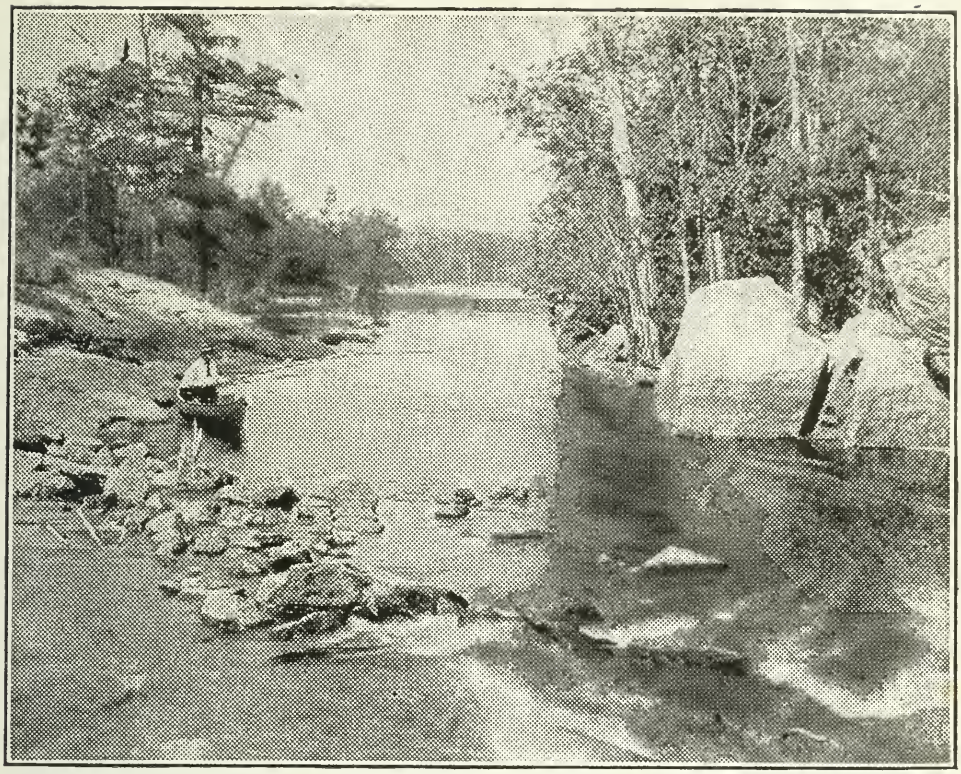
Courtesy, Grand Trunk Railway System.

**In the Kawartha Lakes Region of Ontario**

# *Cutting Down Waste in Wood Mills*

As a result of suggestions made by a number of Coast and Mountain lumbermen, Hon. T. D. Pattullo, Minister of Lands in British Columbia, has taken steps to ascertain if something worth while cannot be accomplished in the way of utilizing more of the waste products of our sawmills and box-making plants. To this end Mr. L. B. Beale, B. C. Lumber Commissioner at Toronto, has been summoned to the Coast for a couple of months in order to conduct the preliminary investigations. Mr. Beale has a thoroughly practical mind, and being so equipped it may be taken for granted that if he makes a recommendation in favor of the utilization of any particular class of waste materials common to sawmills and box plants—and perhaps our woodworking factories also—the laboratory chemist or other highly trained expert may be called in with reasonable certainty that the proposition will be pronounced a feasible one. The feeling is general in the lumber industry that too much of the log is wasted in the manufacture of lumber according to present methods, but solace appears to be found in the trite phrase, "Everyone is doing it."

The millman who refuses to bestow some thought upon this question of utilization of timber waste is undoubtedly making a mistake—the matter is already engaging the serious attention of prominent lumbermen on both sides of the line, who realize the seriousness of the tremendous economic waste involved in leaving 25 per cent. of the original tree in the



Courtesy, Grand Trunk Railway System.

**Perry's Chute near Burleigh Falls, Kawartha Lakes, Ontario**

woods and the sacrifice of another 30 or 35 per cent. of the board contents in the process of turning the tree into finish lumber. There are those who say the day is not far distant when the lumber industry will practise conservation of waste materials after the fashion set by Chicago packers, but the dream is almost too good to come true. Our lumbermen have a long way to go, yet they may arrive. It should encourage them to persevere if they will but recall that large factories employing hundreds of hands are now kept busy manufacturing articles from wood waste that formerly went into the mill burners, and that inventive genius is likely to speed the day when practically everything that now goes to the burner will have a market value.—*From Western Lumberman.*

## NEWFOUNDLAND PULPWOOD

The Newfoundland Legislature, now in session, is expected to enact a law permitting export to the United States of a considerable quantity of pulp wood. This was intended for shipment to England and France, but, because of the shortage of ships, its transfer to those countries has become impossible.

The popularity of the National Forests in the United States as summer playgrounds is increasing by leaps and bounds each year. These vacation wonderlands were visited by over 2,000,000 people in 1916. Of this number Colorado received 605,000, or 30 per cent. of the total.

From the Manager of an Oil Company, Lethbridge, Alberta: "It is with much pleasure that I become a member. I am greatly interested in the work, particularly in the preservation of forested areas for pleasure and game preserves. You may call upon me for any co-operation you desire."

# Upsetting Old Ideas of Logging

Are scientific methods and mechanical improvements to be forever debarred from logging operations? asked D. C. Magnus, at the recent Appalachian Logging Congress.

"Are we, as loggers, keeping pace with the other great industries of the world? Is it not a fact that the lumbermen are being outstripped by their own industrial competitors? He must do more of the work with power-driven machines.

"For instance, the sickle, the knitting needle, the old hand-looms, the needle and thread, the coal pick, and the cross-cut saw were all rocked in the same cradle. The sickle has developed into a reaper, the knitting needle into a great factory filled with humming spindles, the needle and thread into a sewing machine, the coal pick into a coal cutter, and the old cross-cut saw has remained a hopeless case all these years.

"Is it possible for the old cross-cut saw to form an armor that cannot be pierced by the scientific brains of this age?

"The cross-cut saw is not the only tool to which we should bow our heads in shame. Several weeks ago we were moving earth for a railroad grade and found a kit of stone tools that were used by some prehistoric race. Among the number there was a stone axe. This axe was similar to the one we use to-day, with the exception of being stone and having the handle attached on the outside. Is it possible that we must cling to that old stone model forever? Should we not make some great effort to get an electrically-driven tool to replace at least a part of its uses?

"We are living in an age when it requires a number of individuals to compose an efficient unit. The backwoods cabins are becoming landmarks and the cave of the hermit a curiosity.

"Co-operation and concentration effort must be made if we would have our ideals become realities.

"The loggers realize that they can't compete with the other industries. They should begin now to fortify themselves against the future labor problems which are sure to come.

"The time has passed for a lumberman to be content to have a man at the helm of the logging end of the business who is not worthy of a greater title than 'bush man' or 'woods hich.'

A shrewd business man said to me after going over a logging operation: 'I am surprised to learn of the responsibilities of a logging superintendent. To be efficient he must be a timber cruiser, machinist, civil engineer, diplomat, and psychologist.'

"The lumberman's slogan should be "Scientific logging,' and he should put forth every effort to get men to conduct it on scientific lines."

# Canada's Loss by Forest Fires

The statement has been made, and sometimes disputed, that Canada loses from $6,000,000 to $10,000,000 a year by forest fires.

Now comes to hand a report of the West Virginia Conservation Commission showing that in one small state, 710 fires occurred in 1908. This was the estimate of the loss:

| | |
|---|---|
| Area burned over: | 1,703,850 acres. |
| Standing timber burned | 943,515,850 feet. |
| Value of standing timber burned (at 1908 prices) | 1,903,500 |
| Value of lumber, tan bark and improvements burned | $490,175 |
| Injury to soil and undergrowth | 1,703,850 |
| Total of loss | $ 5,097,525 |

Since that time an intensive fire patrol has reduced the loss by nine-tenths. Sufficient money has been saved from this source alone to pay all expenses of the entire State government.

Prior to this time there was no organized effort to control forest fires, each property owner endeavoring to keep fires from burning his own fences and improvements and allowing it to consume all of the forests without hindrance. It was the general rule to set fire to the forests, it being contended that the burning improved the ground and made better range for the cattle.

# *What Alberta Owes to Forests*

(*Reprinted from the Lethbridge Herald*)

"Southern Alberta is as closely linked up with forest conservation as the most heavily wooded part of Canada. Irrigation derives its life from watershed forest protection. Coal mining faces one of its chief problems in a supply of wooden pit props. The fertility of the farm lands owes much to the forest's contribution of moisture to the air currents. The cattle and wheat raiser are extensive users of lumber, and the cost of these wood supplies is an item of high importance. Though we may live far from the edge of growing timber, it is upon us, as users, that the penalties of forest waste are bound to fall."

This statement was made this morning by Robson Black, secretary of the Canadian Forestry Association of Ottawa, who spent the day in Lethbridge, discussing conservation questions with many leading citizens, including President Marnock of the Board of Trade

Mr. Black praised the progressive stand taken by the board in declaring for the riddance of the patronage evil in public administration, and mentioned the mischievious results in forest protection systems operated on the patronage basis.

"Alberta is now the only province in Canada that has not taken provincial action in the thorough elimination of forest fires. The greatest hazard to the maintenance of the irrigation projects of Southern Alberta is the freedom enjoyed by settlers in or near the forest, burning their 'slash' without taking reasonable precautions.

These settlers' "clearing fires" must be stopped at once unless the tree cover on the watersheds is damaged irreparably. The only authority that can act in the matter is the provincial legislature which was asked to pass an act establishing what is called "the permit system" whereby every settler's fire in or near forest country shall be supervised by local fire guardians or Dominion forest rangers. This means practically no expense to the province and is imperatively necessary. Saskatchewan and Manitoba adopted the law without controversy. It is likely Alberta will pass an act next session.

"The water supply of the Alberta plains takes its source in the eastern slopes of the Rockies. On account of free-running fires in times past more than 90 per cent. of the trees are less than 100 years old and 75 per cent. are not 50 years old. As a consequence, the rivers originating in this great protective and regulating area are all subject to gross fluctuation, thereby reducing their value for irrigation purposes.

### *Demands of Coal Mines*

"The coal mines of Alberta use six lineal feet of wood for every ton of coal taken from the earth. The farmer on our plains is the greatest wood user on earth, using nine times as much per capita as the European farmer. Wherever we turn we see the absolutely essential character of forest maintenance.

"The question of provincial ownership of the forests is only distantly related to the question of conservation. The people who lose by the waste of Alberta's forests are the people not of Quebec but of Alberta. All the profits from conservation go likewise to Alberta. The Dominion Forestry Branch, now administering the reserves of Alberta at a cost of $215,000 annually, get back only a part as revenues. The total revenues of the Dominion Government from all sources connected with the prairie forests fall short by about $200,000 of what is expended by the Dominion in their protection from fire and in forestry development. Whoever owns and administers the Alberta forests carries them as a heavy financial liability for long years to come. This is due to the fact that fire destruction has been so excessive in times past that instead of 'cashing in' on present supplies of timber, the forests of Alberta must be nursed back to normal before they can take care of the future wood requirements of the people, and become equal to their function as guardians and regulators of stream flow."

## LIEUT. BIGWOOD KILLED

A cable despatch received by Mr. W. E. Bigwood, of Graves, Bigwood & Co., (lumbermen) Toronto, on June 28, from the British War Office, stated that his son, Flight-Lieut. Paul Herrick Bigwood, of the Royal Flying Corps, has been killed in action in France. Lieut. Bigwood went overseas with an infantry battalion and later was transferred to the Royal Flying Corps, serving in France as an aviator only a short time. He was twenty-one years of age.

## RIFLE STOCKS FOR THE WAR

The New England Westinghouse Company, Meridan, Conn., which has a contract of 1,000,000 rifles awarded by the Russian Government, on which it has been working for more than a year, is now producing 500 weapons daily with 1,600 hands employed. The company is now increasing its output rapidly and expects soon to be turning out 1,000 rifles daily. The present consumption of hardwood lumber for stocks alone is approximately 3,500 feet daily.

## ABOUT LOG RULES

The following was contained in a letter from Sgt. A. V. Gilbert of the Canadian Forestry Corps in England:

"It is interesting to note here some points about board foot log rules. The Doyle & Quebec rules are commonly used in Canada. It is astonishing that the Doyle rule which gives ridiculous results for very small and very large logs should be in such general use in Canada. The large percentage of small logs at our operations in Britain emphasizes the fact that this rule should not be used by this Corps in any calculations. The Quebec Rule gives larger results than the Doyle but not so large as the Maine Rule, and since the latter, as we have shown, does not give large enough results for the class of material we are turning out it is clear that in any calculations it should be used in preference to either Quebec or Doyle Rule."

## FRANCE CALLS FOR FORESTERS

**In announcing the formation of forestry battalions to go to France and aid in supplying trench timbers, railroad ties, mine props, cordwood, etc., the United States military headquarters makes the following comment:**

**"The French forests have been managed for many years with great care and skill. It is the view of the Government forestry officials that if the American forest regiment is to do creditable work it must be able not only to cut and manufacture the timber with high efficiency but also to avoid waste and leave the forests in good shape for future production. This is the reason for selecting mainly trained foresters as officers."**

The Riordon Pulp and Paper Company will plant about 250,000 trees this year near St. Jovite, P. Q.

## ADVERTISING AGAINST THE FIRE FIEND

Various schemes to bring before the public the necessity of eliminating forest fires have been put under way since the beginning of 1917. The response to all of them has been remarkably generous. Business firms have consented in scores of instances to insert special fire prevention advertisements submitted by the Association even when the use of the advertising was costly. Some firms taking this action owned no timber limits or wood-using mills. Extracts from a few letters in addition to those already published, are reproduced herewith:—

From Clarke Bros., Bear River, N.S.: We have read with interest the suggested advertising copy. We shall be pleased to have the copy in question used until October 1st."

From Green Lumber Co.,St. Thomas, Ont.: "We will gladly insert the advertising matter as you request."

From Columbia River Logging Co., Golden, B.C.: "We will have special advertisement run in our paper for several weeks during the dry season."

From MacLeod Pulp Co., Liverpool, N.S.: "We have arranged to have 'copy' sent us published in our local paper during the next four months."

## COMPOSITE STEEL CARS

William Queenan, assistant superintendent of the Burlington railway shops, in an address before the Western Railway Club, Chicago, stated that the composite, or steel frame and wooden superstructed gondola car is superior in nearly every respect to the steel car. In summing up the advantages he specified the following items:

That the initial cost of the composite gondola with the present price of steel should be less than the all steel gondola.

That the composite type of car costs less to maintain than the steel gondola.

That sides of the composite car do not bulge as do those of the steel car.

That records show that while the composite cars cost more to repaint than the steel car, they do not require painting so frequently.

That a large portion of the repairs to composite cars can be taken care of at other than steel car shops.

That certain properties in coal cause corrosion to steel and that wood is not affected by these.

He gave records of 1,000 cars of each type built in 1903. During the last fiscal year, 167 of the wooden cars were in the shops, and 332 of the steel, and the average cost per car of the steel car repairs was 36 per cent. higher than of the wooden or composite cars. The average number of the cars repaired showed that fewer repairs were needed by the composite cars and that the number in service, therefore, was larger.

## 300,000 ACRES FOR RESERVE

The State of Minnesota has set aside for state forests an area of over 300,000 acres of state lands. This tract is composed of scattered sections and "forties" of land, a part of a much greater area of similar character lying in northeastern Minnesota. The National Government had previously set aside over a million acres in this region as a National Forest.

Northeastern Minnesota, in the northern half of Lake and Cook Counties, is a granitic area of outcropping rock ledges, shallow soils and innumerable lakes and water courses. It is the southern extension of a similar great area in Canada.

C. A. MacFayden, formerly of the Dominion Forestry Branch, is now British Columbia District Forester at Fort George.

From the Right Reverend, the Bishop of Kootenay: "I shall very gladly become a member of the Canadian Forestry Association.

"Your object is one of vital importance to Canada, certainly to British Columbia."

# Forest Area Set Aside for Study

The Council of Industrial and Scientific Research of Canada, has persuaded the Dominion Government to set aside one hundred square miles in the Petawawa Military District in Ontario. A sufficient grant will be made to carry out a thorough survey of this area next summer, the work to be done by the Dominion Forestry Branch. Beyond the survey a program has not yet been prepared. The Research Council has been formed for the purpose of ascertaining and tabulating the various agencies which are now carrying on research work in universities and colleges, in Government laboratories, business organizations and industries, scientific associations or by private persons; also to ascertain the lines of work being done and the facilities and equipment and especially the man-power available for such work; to coördinate all agencies, to induce co-operation and prevent overlapping, and to bring about a community of knowledge; to study the problems which confront our industries and to link up the resources of science with labor and capital so as to bring about the best possible economic results; to make a study of our unused resources, wastes and by-products with a view to their utilization in new or subsidiary processes of manufacturing; to develop ways and means by which the present small force of competent and trained research men can be augmented.

This work is being rapidly organized and the following organizations have volunteered to help in it: The Canadian Society of Civil Engineers, Canadian Mining Institute, Canadian Manufacturers' Association, Society of Chemical Industry and the Canadian Society of Forest Engineers. The country will be divided up into districts and volunteer field-workers will cover these districts and gather all available information.

**Forest fires in the United States have caused an average annual loss of seventy human lives and twenty-five to fifty million dollars' worth of timber. The indirect losses run close to half a billion a year.**

## RANGERS' HANDBOOK

One of the most complete little volumes dedicated to the lore and craft of the ranger and woodsman that comes for our review is the Handbook for Rangers and Woodsmen, by Jay L. B. Taylor, forest ranger in the United States Forest Service. The object of the book, according to its author, is to serve as a guide for inexperienced men in the woods. It tells what to carry with you in the woods, how to pack an animal, how to cook and what provisions to take. It gives instructions how to build a field telephone, how to use powder, how to survey, how to handle ailments of pack animals and a thousand and one other valuable hints to the man on his own resources. The book is for sale by "Canadian Forestry Journal" at $2.50 per copy, net.

## MORE CARE WITH FIRES

Cobalt, Ont.—The past couple of days have been very warm and a number of small bush fires are in evidence about the town, chiefly caused by settlers clearing their land. With vivid recollections of the disaster of last Summer, greater precautions will be taken than heretofore, and fire rangers throughout the district are working under much more stringent regulations than in previous years, which should do much to eliminate the danger from this source. Each fire ranger is making a report of the district over which he has charge, and making recommendations to the chief ranger with the idea of eliminating the places where danger of fire is apparent.

# *News Notes of Forest Services*

G. H. Prince, formerly of the British Columbia Forest Branch, and lately assistant to P. Z. Caverhill in the New Brunswick Forest Survey has been appointed Mr. Caverhill's successor as Director of the New Brunswick Government Forestry Division. Mr. Caverhill is now attached to the head office staff of the British Columbia Forest Service.

* * *

R. E. Benedict, British Columbia Forest Service, has been appointed a Major in the newly organized forestry battalion of the United States Army or "Tenth Reserve Engineers (Forest)." Mr. John Lafon, another British Columbia Forester, has attached himself to the same unit. Prof. W. N. Millar, of the Toronto Forest School, is a Captain of the corps.

* * *

H. S. Irwin, formerly district forester at Prince Rupert, and District Forester H. G. Marvin of Fort George have been transferred to the head office at Victoria. The Hazleton and Prince Rupert offices are being handled by District Forester Allan from Hazleton.

* * *

Calgary, July 5th.

B. R. Morton in charge of silvicultural work at Head Office, Dominion Forestry Branch, spent a day at the District Office last week and then proceeded to the Coast where he is in charge of a collection of seed of numerous British Columbia species for the Imperial Government.

* * *

T. W. Dwight, Assistant to the Director of Forestry, spent Wednesday last at the office here proceeding to Kamloops and the British Columbia Inspection District, where he will probably spend a couple of weeks in connection with District Inspector Cameron. He will then return here and make trips to several of the reserves in Alberta. He is looking particularly into timber sale work as well as other projects. Probably part of July will be spent in this district.

A successful Ranger Meeting was held at Morley under the direction of Forest Supervisor St. Clair. The Rangers spent several days at Morley going over all sorts of administrative work and entering into detailed discussion on various lines of improvement and fire protection work. They were also given some elementary training on survey work and taken all round seemed to be pleased with the start made.

* * *

J. A. Doucet left here on the first of May for Edmonton, going thence a few days later to Fort McMurray. He has been down there since early in May on inspection and reorganization of the Fire Ranging operations in the Slave and McMurray Districts. By reason of these efforts an amalgamation of the two districts has been effected and it is hoped to place the whole works in charge of a competent Chief Ranger. Doucet will probably be there for the best part of the summer.

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The manufacture of gun powder requires large quantities of charcoal which can be secured only from hardwoods, and even smokeless powder requires the use of wood alcohol in its manufacture. This product is particularly necessary in the making of gun cotton. Wood alcohol is also used as a solvent in medicine and the wood distillation industry will contribute largely to the extra amount of hospital supplies needed during the present war. Acetic acid or wood vinegar, which is another important product, is used in the manufacture of cordite and liddiate, two high explosives. Necessary increases in the production of steel for war time uses will require a large amount of charcoal for use in blast furnaces.

Besides these direct uses, the development of the dye industry takes over a great deal of the wood alcohol obtained from the distillation of hardwood.

# *Farm Lands in Forest Reserves*

By D. Roy Camerson

*Inspector of Forest Reserves, Kamloops, B. C.*
*in Annual Report, Dominion Forestry Branch.*

"The principal objection made to the establishment of further forest reserves in this district has been the fear of the possible inclusion of agricultural lands. This fear is the result of a statement made some two years ago, that the development of the country was being retarded by the tying up of areas of agricultural lands within forest reserves. This matter has been discussed in my reports of previous years and mention made of the recommended eliminations of land of possible agricultural value. Unfortunately, owing to the war, statutory action has not been taken as yet in accordance with such recommendations, so that a somewhat anomalous condition exists with regard to such lands.

"The present method of requiring action by parliament to withdraw agricultural lands found to be included in forest reserves causes considerable delay, which it would be well to obviate.

"It seems reasonable to expect that, so far as lands valuable only for the production of hay are concerned, the proposed amendments to the regulations with reference to hay meadows will afford the best solution of the utilization of such lands. Observations of the degree of development attained in cultivation of lands of this class by settlers and squatters on adjoining forest reserves show that in the majority of cases the outlook for these people is well nigh hopeless. Now that government work has been largely discontinued, owing to the necessity for economy in expenditure, the unequal struggle has forced many to abandon such claims and seek a livelihood elsewhere. This condition of affairs is evidence of the truth of the statement made by myself previously that the extraneous support given by government work was all that enabled settlers on such lands to remain, and that the lands themselves cannot be considered as suitable for homesteads in the true sense of the term, namely, that they enable a settler to obtain a descent living from them alone.

### *Settlers are Hampered*

"There are, however, lands within forest reserves, other than hay lands, about which there can be legitimate doubts as to their value for agricultural purposes. With the introduction of impr ved methods of agriculture, especially with reference to dry farming, and following the impetus given by the 'back to the land' movement which is bound to come on the termination of the war, it may be expected that there will be very insistent demand for a chance to use lands within forest reserves which possess any potentialities whatsoever agriculturally. The need of preparedness for this eventuality leads me to believe that we can no longer delay consideration of the introduction of a 'forest homestead' amendment to the Forest Reserve Act, applicable at least to British Columbia, which will provide for the disposal of agricultural lands within forest reserves in a similar way to the act of June 11, 1906, with reference to national forests in the United States.

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A personal message sent by the Canadian Forestry Association to more than 3600 "professional" guides, trappers, hunters and fishermen:

Dear Friend:

A runaway fire does no service to sportsman, guide, timber - owner, artisan, or the public treasury. Every man is a loser when fire gets away.

The Canadian Forestry Association in which over 5000 Canadian outdoors men take part, asks your help to keep 1917 as free as possible from forest fires.

We ask you to watch your camp fires as never before. Keep them small and see that they are entirely put out. Don't take chances, but toss on a few spades of earth, or a couple of buckets of water.

We ask you to watch your lighted tobacco. Don't throw away a lighted cigarette or the heel of your pipe. It sounds like an inconsequential request but carelessness on the part of campers hunters and fishermen forces Canada to pay a tremendous bill every summer.

We have about 10,000 forest fires every year in this country—ten thousand bids for desolation and human misery.

Give us a hand in cutting that ten thousand by half. An ounce of "Thrift" in Canada this year puts a ton of weight on the country's enemies! Thrift starts at your finger tips. Watch them. Watch them every time they handle any kind of fire in or near a Canadian forest.

Yours faithfully,
Canadian Forestry Association.

# *Reaching the Public—The Meeting Method*

The holding of public meetings for the discussion of public policies relating to the care of the forests has proved a most valuable means of propagandist work.

These meetings, through widespread advertising in advance, have attracted large audiences of men and women, boys and girls, ninety per cent. of whom had never encountered the subject of forest conservation from any but a casual point of view. The subject can be made intensely interesting to mixed audiences and, with technical phases reduced to plain language, and public responsibility for conservation policies duly emphasized, the impression upon auditors is direct and permanent. Particularly is this so when, as with all Association meetings, hundreds of interesting and 'live' pictures are projected on the screen.

*French Lectures*

French lectures will be commenced during July by the Forestry Association, co-operating with the Department of Lands and Forests, Quebec. Mr. Avila Bedard, of Quebec, will deliver from ten to fifteen addresses, illustrated by stereopticon, in the Eastern Townships, and points such as La Tuque, Chicoutimi, Grand Mere, Three Rivers etc.

*In New Brunswick*

Another series of French lectures will be delivered in the counties of New Brunswick where French-speaking citizens are numerous, and where the question of better fire protection and the protection of non-agricultural lands is badly in need of better public sentiment.

The Secretary of the Forestry Association recently returned from New Brunswick where nine public meetings were held, with very large audiences at all but one point. Earlier this year, lectures were given through British Columbia, Alberta, Saskatchewan, Manitoba and Ontario.

The cost of these lectures bears heavily upon the small resources of the Association, as the meetings are free to the public, and expenses of advertising, printing, frequently the hall rent, travelling outlays, etc. are given no local assistance and must come from the central treasury.

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From Rev. Fred. H. Graham, Diocese of Kootenay, Nelson, B. C.: "It may interest you to know that last Sunday, the King's birthday, there was a Church Parade of local Boy Scouts and Cadets, and in their hearing and that of a crowded congregation I read the excellent and timely appeal of the Canadian Forestry Association to the people of Canada."

# Canadian Portable Homes for France

During a discussion in the House of Commons recently, Sir Geo. E. Foster, Minister of Trade and Commerce, replying to a question about ready-built houses for France, said:—"The matter was brought to my attention, and I took it up with the department and had the woodworkers plan certain houses. After these plans were made it was thought better—and under my advice it was done—to send the plans to Paris to have them thoroughly looked into and vised as it were, by governmental authority, acting either directly, or through a committee. That was done, and we received modified plans from them for two or three different styles of what we would call shacks, to be used temporarily until more permanent buildings could be erected. In every case their plan called for a more elaborate and more costly building than we had planned. Our buildings would cost from $75 to $100, but with the improvements, coverings, and th like of that, suggested by the French authorities, they would cost considerably more. However, a number of houses were constructed and I got transport for them free of charge to Paris, where they were on exhibition in the Champs Elysees. I myself saw them when I was over there last summer. They had the name of Canada on them, and served to show not only our plan of construction for temporary buildings, of this kin l, but our materials as well, and they were seen by a great many people. But the war has gone on much longer than anybody thought it would, and although we know now what they want and though the plans are in the hands of the woodworkers of Canada, not much is being done at present. They, too, I suppose, are awaiting the proper time. What works directly against them is the absolute impossibility of getting transport for goods."

# A Wisconsin View of Forest Guarding

*Extract from Biennial Report of the State Conservation Commission of Wisconsin for 1915 ank 1916, (P. 79).*

The protection of forests from fire is the first essential in the development of a forest policy for a State. Past experience has proven that the forests of Wisconsin have suffered great damage from fire at times, and, without question, history will repeat itself in the future, unless a well planned fire organization is developed, to be ready for the real dry season.

The protection of forests from fire in the north one-half of the State is brought about through an organization of town fire wardens, assistant fire wardens and the protective force of rangers and patrolmen in what is known as the forest reserve region. The town fire warden system is established by having each town chairman become ex officio fire warden and the road superintendents, assistant fire wardens. The chief duties of the fire wardens, of whom there are about 555 in the territory in which there is a fire hazard, are the fighting of fires, instead of prevention and detection. The system of fire protection as applied to the greater part of the State lands or the so-called forest reserve area is one of *prevention detection and control.*

The present forest fire organization outside of the protected area is inadequate since there is no definite plan of detection and prevention. The local wardens usually will wait until fires are upon them before taking any protective measures. From a conservation standpoint, forest fire prevention is the most important

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feature. Therefore, adequate appropriation should be made through State taxation to make it possible to provide for the appointment of so-called district fire wardens, whose duties would be to co-operate with the local fire wardens, timber owners, and others, throughout the entire wooded area of the State.

## POLITICS AND STATE FORESTRY

Pennsylvania has been one of the first states to take up forestry in a serious manner and it is the *only* state that has taken up forest management in a thoroughly logical and professional way, remarks "Forest Leaves." The chief difficulty has been that it began and limited its activities to strictly cut-over forest lands and often thoroughly devastated lands. Hence, it must be a long time before its foresters, whatever their skill, can restore any considerable part of the once magnificent timber cover. To accomplish anything at all the State must *adopt* a far-seeing statesmanlike policy, and then *persistently* stick to it until the foresters can show the final results—one hundred years and more hence. Here lies the chief difficulty in state forestry. Very few states have carried out *any* consistent long time policies of any kind. State activities go by fits and starts, and if there is anything hostile and injurious to the forest work, it is the "fits and starts" method of procedure. The continual organizations and reorganizations, the changing of men and ideas, the upsetting of policies, and particularly *greatly fluctuating appropriations* are incompatible with a successful State Forest Policy. Forestry requires men trained for a life work, and men of faith and vision in the future. Nothing kills the spirit of such a force of men as the uncertainty of what the next legislature will do; of what attitude a new governor will assume toward the work; of what change in viewpoint and ideals the always possible replacement in executive head may bring about.

## RUSSIA'S FUTURE IN TIMBER

With the marvelous increase in the harbor facilities of Archangel and Vladivostock and the extension of railroads in the forested districts, the Russian lumber has a big future. In 1913, the last year of normal export, lumber worth 165,000,000 rubles was exported. By the closing of the Baltic ports this export has been reduced to a valuation of 27,200,000 rubles. Vast stores of timber have accumulated, and in Archangel alone 65,000,000 rubles' worth of timber is ready for shipment. In 1916, when an increase in exports is noticed, little big timber was shipped, the exports being mainly pine for matches and spruce for paper pulp. Domestic consumption of timber has been large, a considerable quantity being required for military purposes. The demand for railroad ties has been

great and the erection of factories all over the country at a time when unusually heavy demands were made upon railroad facilities has caused many of these factories to burn wood instead of coal. As, however, the Ministry of Agriculture possesses a modern and progressive Forestry Bureau, this use of timber for fuel is being managed in such a way as to increase rather than deplete the great forests of Russia.—"American Forestry."

### THE CAT A BIRDCATCHER

In every land, in every tongue, the cat has been noted as a slayer of birds. Maister Salmon, who published "The Compleat English Physician" in 1693, describes the cat as the mortal enemy of the rat, mouse "and every sort of bird which it seizes as its prey." The French and Germans particularly have deplored the destruction of birds by cats. M. Xavier Raspail in an article on the protection of useful birds written in 1894 says that though cats are outside the law and therefore may be killed with impunity their numbers are renewed from the villages incessantly to such an extent that not a night passes without traces of these "abominable marauders." Of 67 birds' nests observed from April to August only 26 prospered; at least 15 certainly were destroyed by cats and others may have been. Baron Hans von Berlepsch, the first German authority on the protection of birds after forty years' experience, says that where birds are to be protected the domestic cat must not be allowed at large. The above are but a few citations many of which might be made to show that the cat always has been recognized as a menace to bird life. Many present day cat lovers, however, claim that their cats kill no birds, or very few, "not more than one or two a year," and that the destructiveness of the cat to-day has been exaggerated to the last degree.

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# THE CASE FOR THE LUMBER EXPORTER

In the last issue of the Journal appeared an article entitled, "Can Canada sell John Bull his wood supply?" written by Captain Douglas Weir, officer in charge, Canadian Forestry Corps, and read at a meeting of the Imperial Institute in London, England, by Col. Gerald White, a well-known lumberman of Pembroke, Ont.

Two or three specific criticisms were made of the Canadian lumber exporter:

"The question of finance also enters into the discussion. The Baltic exporters have worked harmoniously with British merchants in shipping timber on six months' notes, etc., whereas Canadian timber men have insisted on their timber being paid for before it left Canadian ports."

The justness of this criticism would probably be greater were it not applied to the exporting industry as a whole. The largest Canadian timber exporters, particularly in Eastern Canada, have carried on their business with British purchasers for many years to the greatest mutual satisfaction. An Ottawa firm, having probably the largest dealings with the United Kingdom of any Canadian concern, has had an arrangement with two British firms dating back more than a quarter of a century whereby the latter make cash advances on the season's requirements, an adjustment taking place once a year, and this plan has caused no complaints on either side. What arrangement some smaller firms may have and whether they insist on payment before the cargo leaves Canadian ports is a matter in which the larger lumber exporters have no interest. The latter have their permanent selling agents in England and seldom have occasion to look for purchasers or even to discuss questions of credit with transient customers.

The article in question also stated that "timber from Canada did not arrive here in as good condition (as Baltic timbers)—even recently timber received here does not conform to the specifications it is shipped under. This is, of course, due to shrinkage, and dealers in this country consider that the timber was not seasoned before shipment as well as Baltic timber. The British Columbia timbers showed this defect to a much greater extent than Eastern timbers."

Again the authors of the article would appear to have aimed their shaft at individual mills, or possibly mills in a certain section, and cannot justify the charge against the long-established heavy exporters of Canadian timber. One of the great exporting firms in this country, to which the Forestry Journal submitted the question, declared that not a stick entered a cargo that did not have a winter's seasoning to its credit. This is certainly the method of the big and successful Eastern mills. On the other hand there undoubtedly are mills not hesitating to load directly from the saw, without any seasoning preliminaries, and this sort of thing has no doubt accounted for an adverse impression of some English wood users.

Commenting on the criticisms of the Canadian lumber exporter, Mr. Frank Hawkins, Secretary of the Canadian Lumbermen's Association, said, "If any branch of Canadian

(*Continued on page 1226.*)

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# THE WORLD OVER

Bulgaria's forests may be divided into four zones, according to altitude. The lowest and warmest extends from sea level up to an altitude of 1,300 feet, and is the home of the oak, elm and ash. Above this belt, up to a height of 2,600 feet, is the oak-beech transition zone. Between 2,600 and 4,300 feet is the typical beech zone. It contains ample supplies of timber. Finally a pine zone, equally well stocked, extends between 4,300 and 6,600 feet.

Bulgaria's forest area in 1908 comprised 7,086,232 acres, of which 1,611,423 were national property. No statistics have been available since that date. The forests were then valued at $125,000,000, but entire sections were destroyed during the Balkan wars of 1912 and 1913.

* * * *

## UPS AND DOWNS IN MATCHES

A survey of the world's supply and demand for matches by the Canadian Trade Commissioner at Leeds is interesting. Sweden and Norway are the main sources of supply and, before the war, Austria took third place. Germany could not compete with cheaper goods from Japan. France had a government monopoly in matches, but since the largest factories are in the section occupied by the Germans, must now import. The United States and Russia have large match industries, but as both countries have or had a high protective tariff, they could not compete in the international market. Under the revised tariff in the United States, however, Scandinavian matches have made their appearance increasingly. South America supplies itself with an inferior match. Since the downfall of the Austrian supply, India offers a good field. The Japanese control the far East Asiatic market, but in India and other European colonies they have lost ground, apparently on account of inferior quality of product. While during the period 1907 to 1912 the match market was unfavorable, the stopping by the war of several sources of supply has given an impetus, especially to Swedish manufacturers, and prices have been very high, due in part to increase in value of raw products.

* * * *

## DRESSING TREE WOUNDS

Experiments with different substances for covering pruning wounds, by G. H. Howe, showed the following results, says the Bulletin of the International Institute of Agriculture:—

White lead, white zinc, yellow ochre, coal tar, shellac, and carbolineum were employed on pruning wounds of various sizes and age of apple and peach trees, with some wounds untreated for check. The observations were made in the two seasons following the treatment. In all cases the untreated wounds healed more rapidly than the protected ones. Shellac caused the least injury to the cambium, but had least adhesive power. Carbolineum and ochre were very injurious, the white paints the least so; especially white lead was most efficacious; tar is evaporated too easily. Nothing is gained by waiting with the application.

In peach trees, and presumably other stone fruit, all substances produce damage.

The total result is inimical to the use of dressings, but the author admits that for a longer period of observation infection of fungi, which was not observed in the two seasons, might occur and change the finding.

* * * *

## MOTORS FOR LOGGING

Although motor trucks and tractors have been used in logging operations on the Pacific Coast, to a limited extent in the past, such use received

a great impetus last year, due to the high price of steel and railroad equipment, notes the American Lumberman.

One logger reports that on a 7.8-mile haul his motor truck averaged six trips daily, hauling from 3,000 to 5,000 feet log scales per trip.

A logger on the North Pacific Coast, using a 10-ton Knox logging tractor with a trailer, states that the machine makes from four to five round trips daily for distances from 2 to 7 miles, and hauls from 15,000 to 40,000 feet of logs daily, depending on the length of haul and the condition of road.

On a 7-mile haul another logger makes four round trips daily, averaging 4,000 feet per trip.

A firm in Washington uses two tractors for hauling logs to the sawmill, a distance of 3 miles, during the day time, and employs one tractor at night to haul lumber to the railroad, 6 miles distant.

From the above performances, it would appear that the logging tractor is rapidly gaining a place in the lumber industry. It is certain to prove a boon to the small logger.

### U. S. LOGGING CORPS

Lumbermen in the New England States are aiding in organizing forestry units to be sent to England and France. They have inaugurated a campaign to raise, equip, and send abroad, largely at their own expense, ten large portable sawmill units, and have insisted that all expenses until the outfits are loaded on the British transport shall be paid by them, although the British Government had expected to pay for the mill outfits to the extent of about $100,000.

An initial expenditure of $125,000 to $150,000 will be necessary to provide the mills and equipment and to recruit the 400 experienced woodsmen and millmen required for cutting lumber abroad and manufacturing it into railroad ties, trench props, etc.


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# Fertile Farms and Run-down Forests

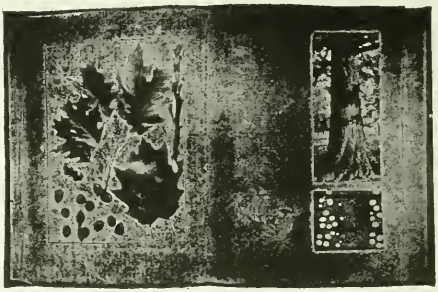
That the great plateaus at the ends of the Nottawasaga Valley in Ontario vividly illustrate the crazy policy of stripping forest lands and leaving their rehabilitation to chance, is one of the conclusions reached by "Ahmik" in the Toronto Globe in the course of a colorful, well-written article.

Ahmik describes the great beauty of the valley and the prosperity of the farms and then—

"But all is not as it should be even here. The plateau at the southern end of the Great Saucer is, in large part, a mass of sand. The elevations at the northern end. in form like the waves of the Atlantic, are also of sand. At one time dense forests of pine covered both the northern and southern rims of the Great Saucer Years ago, however, the mature, trees were stripped to the last stick, the young growth was destroyed by fire, and great stretches of sand, unfit for agricultural purposes, were left almost wholly barren. Had these areas been treated with intelligence the forest growth would have been made a source of permanent income and the bush would have given to the valley an even greater measure of protection than is enjoyed now. By the removal of the forest vast stretches of sand have been exposed that even now are a menace to the rich lands of the valley and will be a steadily growing menace with each passing year.

*Nature Needs Assistance*

Nature is endeavoring to prevent the full measure of evil for which man's folly has prepared the way. Here and there on the southern plateau seedling pines have sprung up. On the sand dunes at the north, which by one of those strange freaks in nomenclature are called the "Huckleberry Plains," seedling pines are more numerous still. If these areas were merely enclosed, and fires kept out, Nature would ere many years reclothe the barren places with timber. The process could be much hastened by judicious planting. But what is really happening? In one section, timbered over a generation ago, a sec-

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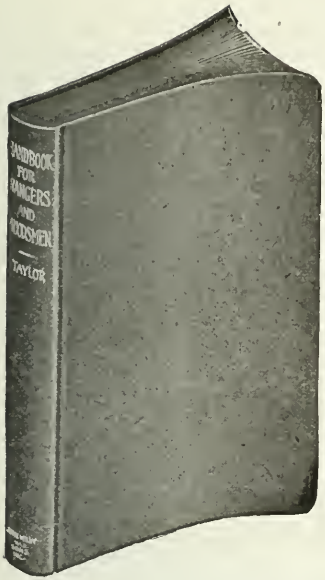


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ond growth of pine had twenty-seven years ago, in many cases, attained a diameter of four to six inches at the but . To-day these trees are ten to eighteen inches at the butt and forty to fifty feet high. Left alone for another quarter of a century or so there would be in this section a magnificent forest of mature pine. But, so I am told, these immature trees are about to be cut down and sawn up for what can be got out of them now. The chances are that, in the subsequent burning of the refuse, fires will be started that will destroy a host of trees still farther from maturity. It does seem a sinful waste of Nature's bounties.

*Ontario's Duty*

These sandy areas at either end of the Great Saucer should never have been alienated from the public domain. They should have been retained as part of a Provincial forest reserve. The duty of to-day is to see that they are brought back into public ownership and made to serve the purpose Nature intended them to serve—the growing of timber.

*Replanting for Soldiers*

In its editorial columns, the "Globe' observes:

In the absence of public regulation, this sort of thing will go on until, between cutting and burning, the dune will be left a barren waste, absolutely bare of tree growth of any kind. Then the dunes, a mass of light sand, lashed by winds sweeping down from Georgian Bay, will become a very serious menace to the fertile valley lying to the south.

To the south of the valley, and north of Barrie, is a sand plateau where the present and past conditions of the sand dunes to the north are repeated. This plateau was also once covered with timber. Years ago the mature growth was removed. To-day there are considerable numbers of young pines growing from seed scattered by the parent stock. Cutting and burning here, too, as the years pass, in the absence of public control, will leave a sandy waste, with more danger to the valley lying below.

Both plateau and dunes are virtually value-less for real agricultural purposes. Both could, under intelligent forestry management, be made to yield a perpetual source of timber wealth, and, incidentally, to give added protection from storms to one of the most fertile sections of the Province. Intelligent forestry management can be secured only by the Province taking hold of the property, keeping out cattle, preventing fire, and filling in the bare places by planting.

The borders of Nottawasaga valley form only one of numerous sections in which such a policy should be followed A well-thought-out and earnestly prosecuted policy of reafforestation is one of the most important duties to be taken up after the war. In that work many returned soldiers could find useful and congenial employment.

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[Courtesy, "Rod and Gun."

**On the Portage**

# *Forest Protection Work in B.C.*

The organization of this year's fire protection work in the province provides for the employment of 65 Assistant Forest Rangers for a period of five months. These men were selected by an Appointment Board, consisting of two Coast and two Interior lumbermen, with three Forest Branch officials, from the applicants who were successful in passing the civil service examination held for this position. These examinations were written and oral, were severely practical, and intended to show the applicant's knowledge of general woods work, fire fighting, and ability to submit reports. In addition the record of each applicant's previous experience along lines of work which would fit him for the work he would be required to do in the Forest Service counted heavily in the final selection of the men. By this system of examinations and appointments—made with the approval of representative lumbermen—the Forest Service is assured of a forest protection field force of men who have had experience in woods work and in the handling of men.

During the most hazardous part of the fire season each Assistant Ranger will be provided with a number of patrolmen, so that during the season of greatest danger this year's plan of organization provides for the employment of at least as large a force as was engaged last year. A change in the method of patrol has been made in some instances. When the system of roadways will permit, the Assistant Rangers have been provided with specially equipped motor cars, and this is proving an effective method of patrol.

---

In spite of old H. C. L., one Pennsylvania State Forest tree-planting camp served 3,000 meals last spring at an average cost of sixteen and one-half cents each.

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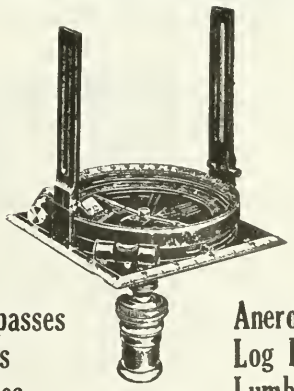

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Canada is undoubtedly to be called upon to become one of the world's greatest sources for the supply of pulp and paper. This industry has grown by leaps and bounds during recent years, and further large developments are to be anticipated, both in the east and west. This will mean a constantly increasing strain upon our forest resources, and must result in careful consideration as to whether very large areas, in which the heaviest cutting is being done or is to be done, are not in danger of depletion.

The Commission of Conservation has started a study of these fundamental problems. This investigation will have for its objects the determination of the extent to which cut-over pulpwood lands are reproducing valuable species in potentially commercial quantities; the effect of fire on reproduction, and the rate of growth of the reproduction present, to determine how long after cutting one may reasonably expect another crop. The answer to these questions should go far in determining what additional measures are necessary, to place the business of pulpwood production upon a thoroughly permanent basis.

The work for this season is under the direction of Dr. C. D. Howe of the

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Faculty of Forestry of Toronto University. A co-operative arrangement has been made, under which the first part of the study is hereby made upon the limits of the Laurentide Company, Limited, whose forester, Mr. Ellwood Wilson, is co-operating in the field investigations. It is expected that similar studies will be made in other sections of the pulpwood forests of Canada during succeeding years. The results will undoubtedly be of the greatest interest to all who are directly or indirectly concerned in the perpetuation of this great industry.
—*From article by "C. L." in "Conservation."*

### The Case for the Lumber Exporter

*Continued from Page 1217*

trade or industry has been the subject of the most thorough and efficient organization, that branch surely is the export lumber trade of Canada. I venture to say that the firms engaged in the export lumber business of the Dominion keep themselves thoroughly well posted and have done so for years, as to lumber conditions existing in Europe, especially in the United Kingdom." Mr. Hawkins believed the critical assertions of Captain Weir's article had no application to the firms represented in the Canadian Lumbermen's Association.

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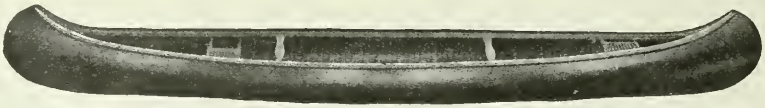
The permit to cut will be subect to the ordinary conditions of the Law & Regulation and the grantees of any of the aforesaid territory must, within a delay of three years, manufacture, in the province of Quebec, with the timber cut in said territory, either pulp or paper in the proportion of ten tons per day, or sawn lumber in the proportion of ten thousand feet board measure per day, per hundred square miles.

Further information may be had by applying to the Department of Lands and Forests.

ELZ-MIVILLE DECHENE,

Deputy-Minister, Department of Lands and Forests



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# Canadian Forestry Journal

August 1917

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# Canadian Forestry Journal

Vol. XIII. WOODSTOCK ONT., AUGUST, 1917 No. 8

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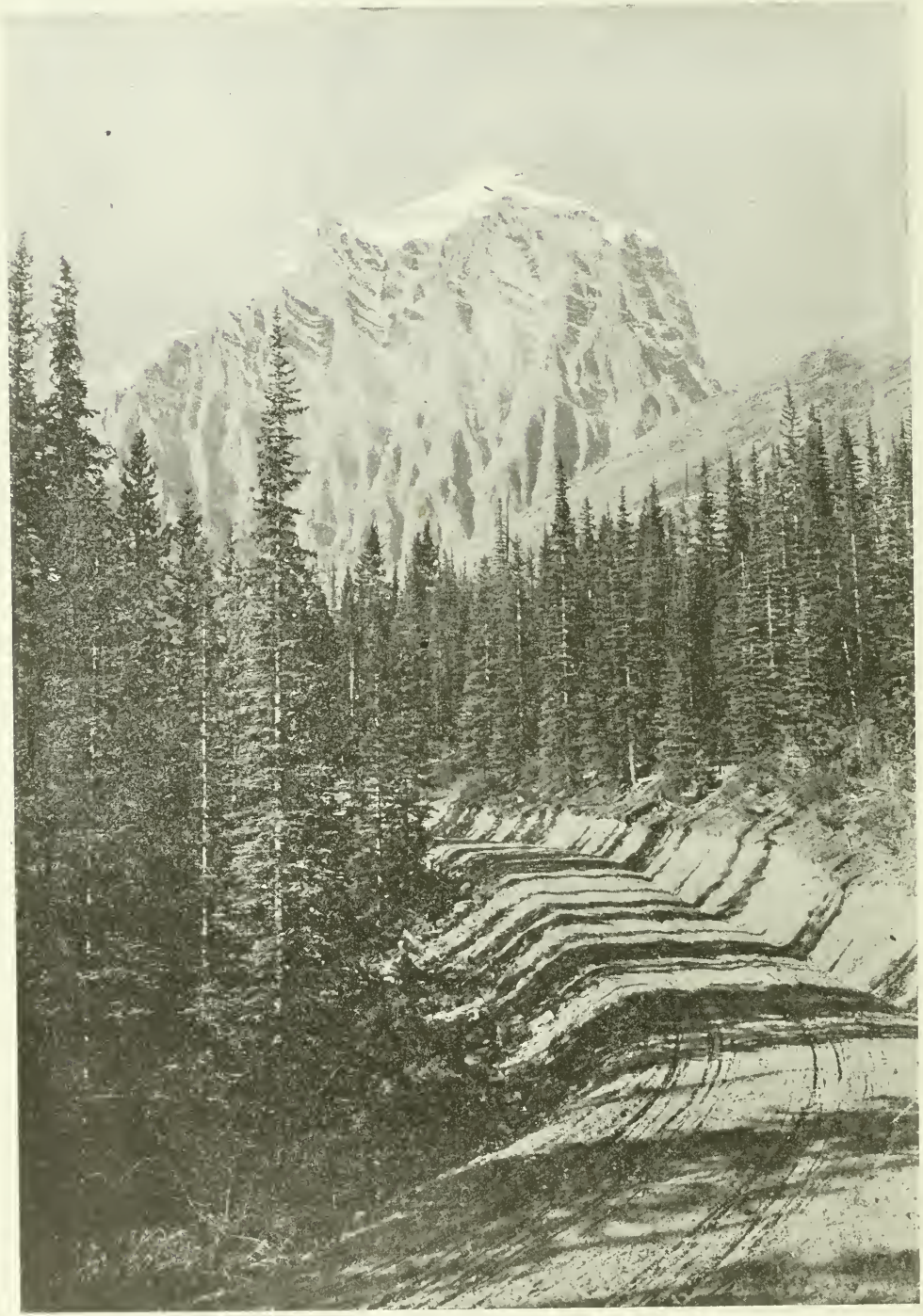


MOUNT SEMPER

# The Dollar Value of our National Parks

## Telling of the Remarkable Gold Mine that Lies in Natural Scenery.

### FIFTY MILLIONS IN TOURIST TRAFFIC

W. T. Robson, Organizer of the Canadian Travel Association, (formerly General Advertising Agent of the C.P.R.), prepared a careful estimate of the amount of money spent by tourists in Canada in the year 1913. His figures were $50,000,000.

These figures place the value of tourist traffic in the fourth position with respect to revenue from Canada's national resources.

The comparison is:—

| | | | |
|---|---|---|---|
| Field crops, | Canada, | 1913 | 509,137,000 |
| Forest products, | " | " | 161,093,000 |
| Minerals, | " | " | 102,300,000 |
| Tourist traffic, | " | " | 50,000,000 |
| Fisheries, | " | " | 13,667,000 |

In adding up our national assets there is one source of revenue which is often overlooked and that is natural scenery. Timber and agricultural lands, coal and minerals, water powers and fisheries—the value of these is easily recognized, but we are just beginning to realize that lands whose chief endowment is scenic beauty may from the purely dollars and cents point of view be as valuable as any and in the long run possibly even more valuable. Like other natural resources, natural scenery is in constant danger of spoliation by private interests and requires conservation and development to reach its highest value. National parks are a recognition of these principles. They are reservations set aside by the government in order that our finest scenic areas may be conserved and developed for public benefit and advantage for all time.

*Travel Now Easy and Cheap*

The value of natural scenery, however, depends chiefly upon its accessibility and it is only within comparatively recent years that it could be said to have a value at all. So long as travel was difficult and tedious, requiring an expenditure of time and money which placed it beyond the enjoyment of all but a limited few, natural scenery was only a local possession. The developments of the last century have made travel so easy and cheap that it is now within reach of almost everyone. The desire for travel, for seeing the customs, manners and scenery of other lands than our own, springs eternal in the human breast and it is a taste that grows by what it feeds on. The consequence is that travel simply for pleasure has in recent years reached enormous proportions, involving in those countries which particularly attract it, expenditures of hundreds of millions of dollars per year.

*A Tourist Gold-Mine*

A glance at the tourist revenues of some of the popular European countries before the war shows how great these expenditures may be. Figures compiled by a trustworthy authority placed the tourist revenue of France in 1913—the year before the war, at $600,000,000. Switzerland's share was estimated at $250,000,000 and Italy's at over $100,000,000. In these countries tourist travel is recognized by the authorities as one of their most important sources of wealth and shortly before the outbreak of the present conflict one of the prominent members of

TAKAKKAU FALLS,
YOHO PARK

the Italian Chamber of Deputies advocated that a State Tourist Bureau should be created by the Government, as one of the easiest and most desirable means of increasing the national income.

The case of Switzerland is the most evident example of what the possession of exceptional natural scenery may mean. Before the development of modern travel Switzerland was a poor and struggling country, dependent chiefly on her lace and jewellery industries for a livelihood. The advent of the tourist brought a prosperity which was felt throughout the entire country and which was especially beneficial to the peasant class. Whole districts where the people had formerly with difficulty eked out a scanty living, were able to subsist in comfort by catering to the needs of foreign visitors.

### *Uncle Sam Sight-seeing*

A large share of this wealth came from this continent. The great gulf stream of tourist travel which flowed across the Atlantic in the decade preceeding 1914, is estimated to have carried between $300,000,000 and $500,000,000 per year to the shores of the Old World. A foreign market which was worth $500,000,000 would receive the respectful attention of any government.

In addition it must be remembered that in the case of natural scenery the capital stock does not diminish with use. It is a veritable Fortunatus' purse. No matter how much is disposed of there is always the same wealth left. In fact, its value tends rather to increase with use,

for as in most other businesses customers who are satisfied with the wares they have purchased tend to become advertisers, and the reputation of being able to attract numbers, brings additional numbers.

Tourist travel within the United States has, in recent years, reached considerable dimensions.

*Profits in Pine Woods*

Figures compiled by the New England Railway lines show that about 1,400,000 guests are accommodated in the New England States during the summer season, and their expenditure is placed at not less than $100,000,000. The pine woods of Maine, without the cutting of a stick of timber are worth $40,000,000 per year from the tourists they attract and it is said that even if the blossoms of the orange trees of Florida never came to fruit they would still be worth more than all the other products of her soil.

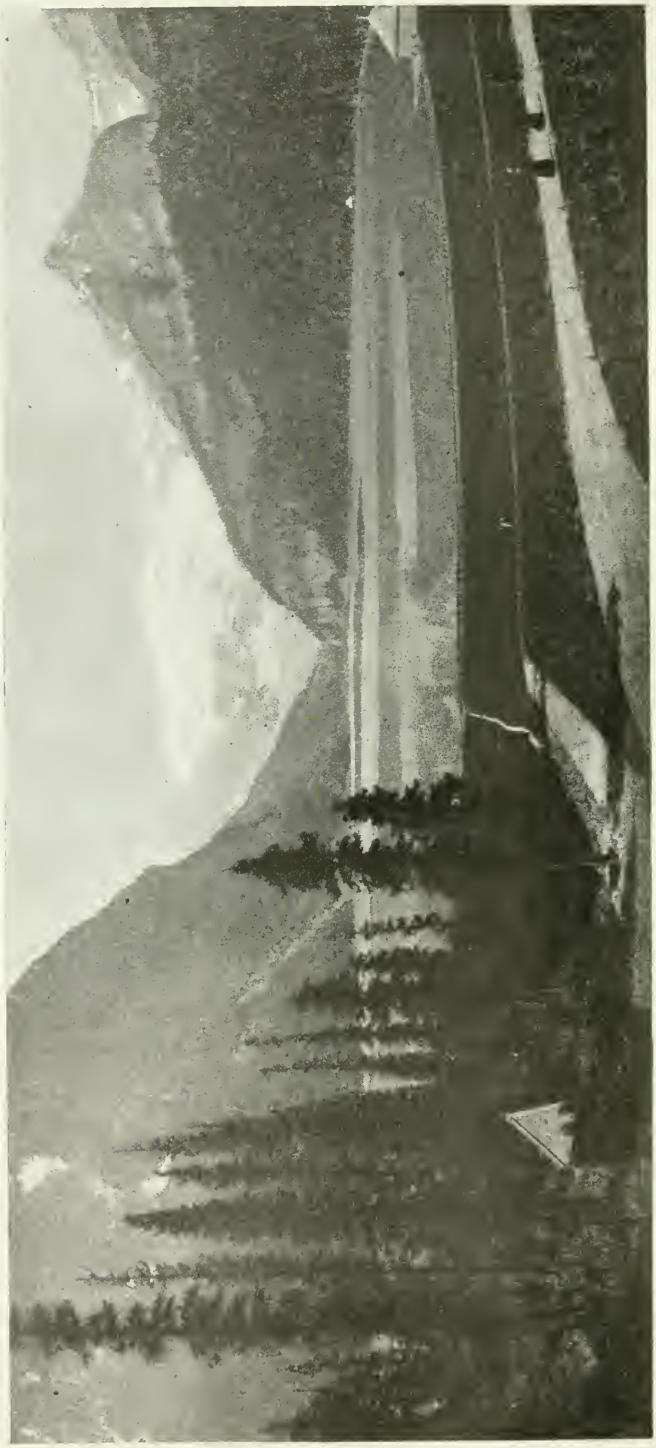
Mary Roberts Rhinehart recently stated in the "Saturday Evening Post" that tourist travel to Cuba at the present time exceeds the value of the tobacco and sugar output combined, while the coral reefs of Bermuda produce a crop of dollars which even the famous lilies and onions cannot rival.

*Canada, a World Playground*

Tourist travel to this country, however, is as yet in its infancy. Canada's possibilities as a playground are only beginning to be realized by foreigners and even by Canadians themselves. But there is no doubt that in the Canadian Rockies Canada has natural scenery of sufficient attractions to draw nature lovers from all parts of the world. Dr. T. G. Langstaff, the famous English alpinist, after his visit to this country a few years ago, declared the Canadian Rockies were destined to become the playground of the world for the next century; other travellers familiar with the Alps, the Andes, and the Himalayas affirm that the Canadian mountains have a charm and attraction of their own which the higher ranges cannot supply.

The average tourist, however, as Secretary Lane recently pointed out, seeks the line of least resistance. Beautiful scenery alone is not sufficient to bring continued numbers

MALIGNE LAKE, JASPER PARK.



LAKE LOUISE
ROCKY MOUNTAINS PARK.

of people to a district. As a rule the tourist seeks the best available but only where it is readily accessible and where there is satisfactory accommodation.

Development and organization is as necessary in the tourist business as in any other. No matter how wonderful our Rockies may be, the majority of people would not care to visit them unless assured of comfort, convenience and safety.

*What National Parks Mean*

National Parks provide in the best way the necessary organization. They first preserve and protect the area forever and then see that it is made as accessible as possible to all classes of people. The Dominion Parks Branch concerns itself with the quality of service of whatever kind rendered by those dealing with the tourist: Character of accommodation; avoidance of congestion; protection against extortion; provision of minor attractions to fill in between the nature trips; the construction and maintenance of roads and trails of first class character in order that the various attractions may be comfortably and safely reached; special care in the matter of the dust nuisance and the rough road nuisance; supervision over sanitary conditions; water supply, horses and vehicles, guides, drivers, charges and rates; furnishing of full and reliable information; and, generally, in not only reducing discomforts to a minimum but so administering matters that the tourist shall be as well satisfied with the treatment received while in the parks as he is with the natural beauty of the scenery.

*Publicity Pays*

Although comparatively little has been done in the way of organized publicity for the Canadian Parks, they attract each year an increasing volume of traffic. The total number of visitors at the two chief resorts in the Rockies—Banff and Lake Louise—during the 5 years from 1910 to 1914 inclusive, was 321,823, about half of whom were foreigners. In 1915, the year of the Pacific exhibitions, the numbers reached over 100,000. It is difficult to estimate what this traffic is worth. The Secretary of the Interior at Washington estimates that in 1915 over $100,000,000 of the money which formerly went to Europe was diverted to the United States National Parks. It is only within recent years that the United States government has recognized that national parks pay in mere dollars and cents, and it is now entering upon a very active and aggressive policy of publicity and development in order to reap as much as possible of the commercial benefits of its national parks.

*The Coming of The Motor*

Within the last two years a new factor has developed which promises to increase enormously tourist travel to the national parks of both countries. This is the automobile. Formerly almost all of the United States parks were closed to automobiles. About a year or so ago as a result of very strong representations they were all finally thrown open and the influx of travel resulting has been remarkable.

In 1915, 12,563 cars entered the various parks. In 1916 there were 19,848 cars, carrying 78,916 tourists. Mr. Stephen T. Mather, Assistant to the Secretary of the Interior, who was specially appointed by him to look after parks administration and development, says in his recent progress report: "This tremendous increase in automobile travel leads to one conclusion only, and that is, that in the early future, travel in private machines will overtake the increasing railroad travel and constitute the greater part of all park travel."

*New Auto Roads*

Motor travel through the Canadian parks is as yet small, compared with that in the United States parks owing to the absence of through motor roads in this country, but when once the new transmontane motor road from Calgary to Vancouver is completed, there is no doubt that thousands of people will wish to take advantage of the opportunity of seeing the mountains in this intimate and delightful way. For it

VALLEY OF THE TEN PEAKS, ROCKY MOUNTAINS PARK.
FROM MORAINE LAKE ROAD.

EMERALD LAKE, YOHO PARK.

will be difficult to find anywhere in the world a tour which can surpass the attractions which this new road will open—hundreds of miles of continuous travel through alpine scenery of unsurpassed grandeur, over a road which has an elevation of nearly a mile above sea level but never exceeds a grade of six per cent.—this will form a holiday tour which few, if any, other countries can offer. The road is already open from Calgary to the Divide and under construction in British Columbia. It is expected that a branch road will also be completed in the near future, to Lake Louise. Last autumn several hundred cars came to Banff from the prairie provinces and this is undoubtedly only a beginning of the tide of travel which the future is likely to develop. Thousands of prairie farmers now own cars and a trip to the heart of the mountains in a pleasant and inexpensive way is already within their reach. Calgary is only 70 miles from Banff; the crest of the Divide, 30 miles farther. With good roads this is a journey of only a few hours. As soon as they realize the situation, there is no doubt that increasing numbers will avail themselves of this opportunity. Last season, many motorists brought with them tents and camping paraphernalia. As a rule this class of tourist prefers to "camp out" while in the parks in preference to staying at hotels and during the past summer a permanent camp site charmingly situated at the junction of the Bow and Spray rivers, was laid out for their accommodation. This year the different Automobile Clubs of Alberta are holding an "auto week" at Banff when a programme of special attractions will be arranged for their amusement.

*The Rockies Next*

Motor travel has in the last decade made a playground of the White Mountains; in the next it seems likely to discover the Rockies. No estimates have yet been made as to the value of this class of travel but its sum total is no doubt large. In the Pacific Coast and Western States, it is considered so important that an organized effort is being made to attract it. Denver recently spent $75,000 in advertising its attractions and expects, it is said, to get $50,000,000 in return, largely through motor travel. These figures are enormous and at first sight unbelievable but they indicate the possibilities which lie in motor travel.

*"People's Estates"*

The above facts indicate why the Dominion parks may be considered a sound business investment. Money spent in development will undoubtedly bring in a return many times the amount invested. But the greatest value of national parks after all cannot be reckoned in dollars and cents. Our national parks have great potentialities of wealth but they are worth more for their potentialities of pleasure and vitality. They are great playgrounds set aside forever primarily for the advantage and enjoyment of Canadians, so that the time may never come in Canada, as it has already come in many parts of the older countries, when almost all the beautiful wild places of Nature will be in preserves owned by the wealthy and into which the people are not allowed to come. The Canadian parks are in reality "people's estates" providing facilities for the best kind of recreation, that which is found in the great out-of-doors. As such they are reservoirs of pleasure, happiness and vitality the value of which it is impossible to estimate.

## NORWAY HOUSE LOYALTY

Extract from monthly report, for February, 1917, from Mr. Jas. T. Blackford, Chief Fire Ranger, Norway House, Manitoba.

"In this connection it might be permissible for me to mention that during the month a patriotic concert was given here at Norway House for the entertainment of the Indians and in aid of patriotic funds. Each of us as rangers spent considerable time in planning for the success of the evening and as chairman I gave an address on the Union Jack. Proceeds were, with donations, $120. All these things, I believe to be indirectly in line with our work."

# "Provincial Rights"—And the Western Forests

By the Editor.

## What Ownership of the Forests Would Actually Mean to Prairie Provinces.

Premier Sifton of Alberta was sponsor of a resolution at the recent Winnipeg Convention of Liberals to the effect that Manitoba, Saskatchewan and Alberta should be placed upon the same basis as the older provinces in respect to ownership of their natural resources.

With the political side of the long-standing dispute over control of natural resources in the prairie provinces the Forestry Journal has no concern. So peculiarly, however, is the question related to proper management of the Western forests that some reference to it in these pages is legitimate and desirable.

No Canadian concerned in conservation as a vital public policy has his primary interest in the name or political identity or even the location of those entrusted with the protection and development of the forest resources of the prairie provinces. What *happens to* the western forests is the main, indeed the only point of apprehension. One may retort that the western provinces are as capable of estimating their own forest problems and applying policies as is the Dominion, and to that end might be willing to institute Departments of Lands and Forests.

### *Does West Expect Revenues?*

On the other hand, it is undoubtedly true that the Western provinces, or at least the bulk of their citizens have an impression that ownership of the forests would constitute an immediate and rich source of revenue to the provincial treasury and that in demanding control of the forest resources they are asking the Dominion to enhance their cash income. That the ownership of the Western forests is an immediate financial liability to the Dominion Government, that the total income from Western forests does not equal the total outlay for protection and improvement is a plain fact that invariably causes incredulous wonder when brought to the attention of the Westerner. In speaking to audiences in many Western cities in April last the Secretary of the Forestry Association encountered a universal impression that the Dominion Government was making a snug fortune from owning the forests of Manitoba, Saskatchewan and Alberta, and that the main motive in retaining the forests under Dominion authority was probably cupidity.

### *What Protection Costs*

The Dominion Forestry Branch spends $100,000 annually on forest protection in Manitoba. The total revenues do not exceed $12,000.

On the forests of Saskatchewan $145,000 is spent by the Branch and $9,000 is received.

On the forests of Alberta $200,000 is spent and $18,000 is received.

Even counting in the receipts of the Timber and Grazing Branch, the Dominion Government spends about $200,000 a year on the prairie forests that is not covered by income.

If the forests are handed over to the western provinces, they must accept the situation as it actually is, not as political fairy tales would have it appear. Manitoba, Saskatchewan, and Alberta, instead of adding to their revenues, would then have to find at least $200,000 from some fresh source with which to pay the

cash deficit on one year's handling of their new forest possessions.

*Subsidies Forfeited*

More than that, they would automatically forfeit the provincial subsidies paid by the Dominion Government amounting to:

Manitoba $409,007.
Saskatchewan $562,500.
Alberta $562,500.

as a Dominion allowance in lieu of public lands.

These subsidies are paid as compensation for Dominion control of the natural resources, and would lapse with any transfer of title to the lands.

What proportion of the subsidies is represented by the forest resources is not ascertainable, but assuredly it would represent a very large sum for each province. The net result would be that Manitoba, for example, not only would lose that portion of its provincial subsidies, represented by the forests, but would have no immediate financial compensation whatever from forest management and must needs disburse a very large sum annually from general taxation to pay for forest patrol.

The Forestry Journal again emphasizes its dissociation from the political phases of the question and its sole desire to shed the light of statistical facts on a very evident misunderstanding.

*The Interests of the West*

If the West asks the right to improve the conservation methods as applied to its provincial forests and is willing to assume a very heavy annual outlay for that purpose, then the transfer of the forest resources from the Dominion Government takes on a rather pleasing color. But if certain Western leaders, believing they are on the trail of a gold mine, propose that one single dollar shall be spared from the necessary outlays now applied to forest protection and restoration in the prairie provinces, then no citizen of Canada can support the proposition without betraying the vital interests of the West itself.

The prairie provinces need their forests. Their northern areas are designed by unchangeable natural conditions for tree growing and for that mainly. Seventy-five or eighty per cent. of the northern lands now tree covered will never pay profits to agriculture. To strip them of timber by means of forest fires means to strip them of the only income-producing crop they can ever give. They will become the desert lands of the West. Thousands of square miles are already in that condition.

*Fire Ravages*

The truth, as fixed by reconnaissance parties of the Dominion Forestry Branch, is that a survey of 100,000 square miles across the tops of the three prairie provinces showed that only thirteen acres in a hundred of lands naturally well timbered, contained trees of eight inches or more in diameter. In other words, series of disastrous forest fires, coming in cycles of, roughly, thirty years, have so gutted the prairie forest supplies as to reduce them to a fraction of their original values. Unless the prairie province forests are kept clear of fires by Government protective systems, such as are now applied by the Dominion, and built up by replanting and by regulating cutting operations, — all of which involve heavy expense—the provincial forest resources will soon be in such hopeless condition as to be hardly worth holding by either Dominion or Province.

*How Forests Contribute*

The western forests, as they stand, are of immense value to the settlers in the neighborhood of the Reserves, who get practically free lumber. They support numerous lumber industries and give invaluable aid to the coal mines with pit props, and to the irrigation enterprises with watershed protection. One must bear in mind, however, that the population of the West is only in its infancy, that the future will place a value upon the forest possessions incalculably greater than does the present generation. The population of the New Canada of a few years hence will require abundant and cheap wood sup-

plies even more than the people of 1917. For every tree maturing in 1930 or 1950 there will be an important use and an eager market. The province that possesses a near-at-hand wood supply will outstrip the province in which neither care nor foresight has been exercised in its growing forests.

The forests of Alberta are primarily for Alberta's use. So with Saskatchewan and Manitoba. *Each province gets all the dividends of conservation, whether that conservation is applied and paid for by a provincial or a Dominion Government.*

*The Real Question*

To all informed students of the situation the question to be settled is not who shall administer the forests of the three prairie provinces, but whether any authority, save the Dominion Government, would be willing to put up the money to do the job at all. It is not a matter of selling timber and securing nice profits for the public treasury but of *growing* the timber of overtaking the gross damage of repeated forest fires. Not of cashing in on some of the "inexhaustible" resources but of stopping the exhaustion. Not of extracting financial fillips for the present, but of laying a broad foundation for the necessities of the future. This is something of what is meant by "control of the forest resources of the prairie provinces." And it is at the same time substantially opposed to what the platform exponents of 'provincial ownership' sometimes would wish their constituents to understand.

# *Who Owns the Young Growth?*

"Does a limit holder own the young growth?"

A most interesting decision on this point was rendered recently in the courts of Quebec by Judge L. J. A. Desy, of the Superior Court, Three Rivers district Judge Desy decided that a licensee could sue on fire damage caused not only to his timber of legal size but to what had not yet attained the dimensions on which his cutting rights were based.

The dispute arose through a suit instituted by a licensee against a railroad contractor who, in the face of warnings, had set fire to a pile of old ties and caused a serious burn in adjoining timber and young growth, but particularly to the latter. The defendant's lawyer entered the ingenious plea that as the licensee was permitted by the Government to cut only what was of a given diameter, that therefore the Government was the owner of what fell under that diameter. Licenses being renewed year by year, argued the defendant, it was preposterous to assert that a license holder had more than a year's cutting rights or could assert that certain trees would become his property many years hence when they had reached maturity.

Judge Desy, however, looked upon the licensee as the proprietor of the young growth for the reason that his rights could in future increment not well be cancelled unless by violation of the Government regulations. The defendant was obliged to settle the claim, which was in the neighborhood of four thousand dollars.

## THE COVER PICTURE

The cover picture this month shows Mount Assiniboine, British Columbia. It was taken by Mr. Herbert O. Frind, a well-known member of the Alpine Club of Canada. The July cover picture was also from one of Mr. Frind's photographs.

## THE CANADA LUMBERMAN

The annual number of the Canada Lumberman is a particularly handsome and elaborate production, containing numbers of special articles of decided interest and value. Editor Horace Boultbee is to be congratulated upon the scope and timeliness of the contents.

# How Shall Planted Lands Be Taxed?

## Redeeming Waste Areas Requires Uniform Method of Taxation.

The taxation of waste lands planted in forest trees is so closely bound up with the problem of reforestation in Canada that any great extension of forest tree planting must await a decision of the tax question.

The municipality that wishes to redeem its stripped lands and turn them to account cannot expect that any private company or individual is going to invest large sums on the prospect that when the growth reaches a twenty or thirty year size the investment is to be swept into the municipal exchequer as taxes.

### *Why A Company Acts?*

A pulp and paper company may, and often does, find a practical advantage in planting up cut over or farmed-over areas near the mill, in which case long-term tax agreements are arranged locally. But this is managed frequently by the company's undertaking to build certain roads and give employment in the nursery work to local farmers. In the case of the Laurentide Company at Grand Mere the planting up of waste lands—now in excess of 500 acres—has given employment to numerous settlers, many of whom were working on poor land nearby, and has resulted in greatly improved roads. Indeed at one point, the financial impetus of the nurseries, road building, etc. has put one community closer to real prosperity than ever could have resulted from farm work alone.

In the same section, the timberlands are taxed one tenth of one per cent. on the valuation which does not amount in any case to more than $4.00 to $5.00 per acre for timber lands.

### *Assessment $40 an Acre!*

How grossly the estimates of assessors and municipal councils vary may be seen from an attempt near Sayabec P.Q. to assess bush lands at no less than $40 an acre, the tax on which would have forced the owner to turn the area to immediate account whether or not it was ripe for utilization, or whether the owner's market could have absorbed the material, at the moment.

It has been suggested to the Canadian Forestry Association that one of the most pressing subjects which could be submitted to the next representative meeting of timber owners is that of taxation. As matters are to-day, it has no uniformity. Even if the available information on the subject were gathered together, and a clear argument given, why a real distinction should be made between forest and other crops in the interest of timber conservation, and the restoration of waste lands to timber bearing condition, a great service would be done.

Certainly few private individuals can be asked to undertake forest tree planting on even a small scale, unless there is a guarantee that at maturity the municipality will permit the deduction of original cost, plus interest, plus cost of protection and cultivation before arriving at present value for taxing purposes.

### *Ontario Allows Exemption*

Ontario had a happy impulse in the planting direction some years ago and passed an Act empowering municipalities to grant tax exemption on woodlands up to 25 acres. The land in question must be held for timber production solely and no grazing could be allowed within its borders. The Act defined the term "woodland" as one containing a given number of mature or semi-mature trees "or 400 trees of all sizes" which would, presumably, cover a plantation. As far as the Journal is aware, the Act has never been applied by

any Ontario municipality, probably for lack of any educational propaganda favoring better care of woodlots and the planting up of barren lands. Ontario presents an enticing opportunity in this respect, which might appeal to the Department of Lands and Forests when present reorganization of the forest protection work is running smoothly.

*A Scottish View*

The Royal Scottish Arboricultural Society recently submitted to the Reconstruction Committee of the British Government some truths on the taxation of planted lands. They are suggestive, at least, of similar consideration between local or central governments and private planters:

The reasons for the encouragements suggested are—

1. That every acre of land planted is a gain to the country, and that this gain can be obtained more cheaply by inducing owners to plant than by the State buying the land and doing the planting itself.

2. That an immense quantity of timber has been felled to meet national requirements during the war, without any corresponding planting having been done; and that it is necessary to stimulate replanting.

3. That many persons who would be willing to plant are not in a financial position to do so; whilst others are not prepared to incur the whole loss of an outlay for which they cannot expect any return during their lifetime.

4. That from 2½ percent. to 3 per cent. is all the return that can be counted on for money invested in planting, and that for this return the planter must wait many years, whereas he can obtain an immediate return of 5 per cent. if he invests his money in other ways. That, therefore, if the State desires him on national grounds to invest his money in planting, it must offer him some compensation for doing so.

*Money Inducements*

The following are suggested as inducements which might prove effective; and they should be given equally for the renewal of old plantations and the creation of new ones:—

1. A bonus of 1 pound, 10 shillings per acre for every acre planted—the only condition in this case being an undertaking on the part of the owner that the trees selected shall be suitable, the planting properly done, and the young plants protected against damage by rabbits.

2. A bonus of 3 pounds for every acre planted. In this case, besides the above-mentioned conditions, the Government would have, in the event of war, the first claim to the timber, at the average price of the three preceding years.

3. An advance of the whole sum required for planting, to be repaid, capital and interest, by annual instalments spread over a considerable period. This method may be preferred by a certain number of landowners, though the number may not be great at present owing to the high rate of interest prevailing.

## FIRES STARTED BY QUARTZ PRISMS?

The Journal is in receipt of the following interesting letter from Mr. R. F. Davy, Assistant Engineer, Department of Public Works, Temiskaming Station, P.Q.

Dear Sir:—

Will you kindly publish the following in your next issue as I would like to get comments and to know if others have advanced this idea re forest fires. In 1906 I was Locating Engineer on the National Transcontinental Railway in Northern Quebec—when camping on the Hurricana River I noticed a forest fire start away to the North and to the West of the river. I am practically certain that no Indians were in the vicinity and I am also certain there had been no lightning up to that time of the year. A thought occurred to me that this fire was caused by the reflection of the sun rays on some white quartz exposed on the hill side—the quartz acting as a prism or a sun glass. We know fire can be started from a prism made of ice and the reflection of the sun. The dry grass or vegetable matter lying near this exposed prism would easily light and spread.

# Damaging Fires Sweep Sections of The West

## Dry Weather Created Hazardous Condition, Resulting in Heavy Loss.

The forest fires in Western Alberta and British Columbia during the last two weeks of July resulted in loss which, with all accounts in, will prove to be substantial. At least eleven lives were sacrificed in the Spruce River Valley fire, many camps swept clean, and much timber turned to charcoal. Estimates as to exact loss will not be available for some weeks. It will be interesting to learn how far standing timber and young growth have been affected, for in the exceedingly hot weather—some districts without a drop of rain for more than thirty days—the fighting of fires, once given a good start, was difficult in the extreme, and valuable areas of timber and of protective growth on the watersheds must have been destroyed.

Of even greater interest and importance will be the reports upon the causes of the fires. Unofficially the Spruce River Valley fire is said to have started in a tent and to have been helped greatly by the presence of logging slash. Again, in the official report on the Crows Nest Pass fires which cost a large sum on the part of the Dominion Forestry Branch for fire fighting alone the claim is made that a pile of debris on the Peter McLaren Company's mill property was the origin of the trouble. If the Western fires result in an official statement throwing some light on preventible causes, the means of forestalling a repetition of the disaster will not be wholly lacking.

*Recalled Days of* 1914

British Columbia's experience has been the most alarming since the memorable midsummer of 1914. The following report from Victoria, B.C. under date of July 23rd indicated the grave situation existing at that time:

"From nearly every section of the province this morning reports have reached the provincial lands department indicating that the fire situation is serious. Hot, dry weather with a considerable amount of warm breeze is making it extremely difficult for the various gangs of fire fighters to work with success.

"Previous to the beginning of July in 1914 there was very little trouble. Then, however despite the fact that more men were available for patrol duty, for two months there were a large number of outbreaks in many sections.

"Reports to hand this morning from Cranbrook state that no fewer than fifteen fires are burning in that district. Vegetation is reported to have been completely dried out while the weather is the hottest on record.

"Already this season in the Fort George district forty-two fires have been reported and the present outlook is extremely serious. A large fire out of control is raging near Rau Shuswap in the Tete Jaune Cache district. In the Windermere district of Bugaoo as well as on the Kootenay and Bu Rivers many patrol men are on duty with still a number o fires as yet not under control. The condition of the vegetation in the locality of Prince Rupert has been helpful in checking fire progress and both there and at Kamloops the damage has been of an extremely light nature.

"Hot, dry and windy is the telegraphic report from Nelson this morning, with thirty fires burning. Christianson's mill at Boundary Falls was entirely consumed by the flames on Saturday. Ninety men are fighting against difficulties at Sproule Creek; the fire is now beyond control and is sweeping with alarming rapidity up the north arm of the creek.

*Country Over Dry*

"A large fire near Long Lake, in the

Vernon district, broke away before the gale on Saturday and became entirely unmanageable. Every effort is being made to confine the extension of its progress as much as possible. The extreme dryness of the timber and the continued heat in the Okanagan Valley is seriously increasing the speed of the fires in this locality, the hard work of the patrolmen notwithstanding.

"Six fires are reported from the Similkameen section and minor affairs at Baefaux Lake and Cherry Creek, all of which are under complete control. The situation on the Island is considerably less serious. The Cowichan Lake fire is regarded as safe now, although still smouldering.

Small fires are reported at Courtenay, Ladysmith and Shawnigan. While there has been great difficulty in securing sufficient men to counter the fires in many parts of the province, the organization of the department has done a great deal to bring the outbreaks under subjection much quicker than has been the case hitherto. The most fortunate feature of the fires this season has been the small amount of destruction of merchantable timber, a striking contrast to the terrific damage in 1910."

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On the same date came this despatch from Nelson, B.C.:—

Nelson, B.C., July 23rd.—With much of the vegetation in the woods as dry as tinder, forest fires spread at an alarming rate on Saturday and Sunday. In two cases, on Sproule creek and in the Trail district, men fighting the fires were caught in tight corners, and had narrow escapes from perishing in the flames. In the Trail district the fire, which jumped the Columbia river on Sunday and menaced the city of Trail, setting some houses ablaze, ran at the rate of two miles an hour. Winds all through the district fanned the flames, and virtually every fire to-night is reported to have got out of hand. Only rain can stop them. There has been none since June 24th.

*A Narrow Escape*

Doukhobors who were employed as fire fighters in the Trail district were surrounded by fire and had difficulty in getting out. At Sproule Creek a number of men were caught in much the same way and had to wait until night before they could make their way back to safety. So rapidly did the Sproule Creek fire spread that the crew had to give up any more hope of preventing the outbreak from spreading up the mountains and was compelled to direct its own whole efforts to keeping the flames from creeping downward toward Kootenay river. Great volumes of smoke appeared in the sky like clouds tinted by the red flames below.

*Fires in Washington*

A great fire is raging in the State of Washington. Fought by 200 men, it was out of hand Sunday and traveling toward Patterson, B.C., near the international boundary. Trail was reported to-day to be safe, the blaze having been driven back, but it is still raging around the city, according to word from there at midnight, but gradually spreading away from it. The fire on the Duncan river in the Lardo district has got out of hand and is eating into a big stand of cedar. Fires in the Arrow lakes district, which last week were reported under control, are out of hand also and spreading in the vicinity of Arrow Park, East Demars and Whatshan lake.

*Flathead Valley Suffers*

A despatch three days later declared that the fires in Western Alberta were then under control. No rain had fallen at any point in the south forest country. Fires between Fernie and the Kootenay Lakes were still burning without restraint, there being a great dearth of men to combat the progress of the flames. "The timbered area in the Flathead Valley" remarked the Calgary News-Telegram, "has already sustained a loss approximating hundreds of thou-

sands of dollars, say the lumbering men familiar with the area affected, and the portions already destroyed and threatened with destruction are among the best of the south British Columbia district."

On July 26th, Nelson had its first rain for 33 days. The fall was heavy but brief. Fernie reported a gradual dying down of the worst of the old fires. On July 27th, however, high winds arose, causing renewed anxiety. A new fire broke out at Ella, from locomotive sparks, and another starting in one of the camps of the Elk Lumber Company on Spruce Creek, up the Elk River, found its way into a neighboring gulley. The consequences of this outbreak is graphically summed up in the following despatch dated, Fernie, July 29:—

56 *Trapped*—30 *Accounted For*

Fernie, B.C., July 29.—Two more bodies so charred that recognition is impossible were taken down from the scene of the Elk Lumber company fire of Saturday and Nick Muscovich, who displayed unusual bravery following the fire, dying to-day, has now fixed the known dead at 11. The various directions taken by the fugitives from the fire has made it difficult to check up the survivors. It is known that 56 men were trapped and 30 are accounted for, but it will be some time before the final result is known.

Fernie, B.C., July 29.—Eleven men are known to have perished and a number are missing in a fire that swept the Spruce river valley, 15 miles northeast of here Saturday afternoon. Sixty odd men and about 20 teams were trapped in camp 14 of the Elk Lumber company, which is situated in a blind valley and their flight over the mountain was most difficult.

Eleven bodies have been picked up in the rear of the fire and the terrible agony the men endured is shown in their contorted features. Nick Muscovich, a Russian, was found alive, his eyes burned sightless, and almost demented. His body was severely burned and all his clothing was gone, except his boots, but after being given first aid he reovered and urged the rescuers to leave him and help men he knew to be beyond him. With assistance he walked to the emergency hospital and was later brought to Fernie.

## *Terrible Experiences in Spruce Valley*

A vivid picture of the sudden and vicious sweep of the Spruce River Valley fire will convey to readers some idea of the terrible character of a conflagration in mountain regions. It is worth noting that the cause of the outbreak was said to be in a lumberjack's tent, possibly from a cigarette, and also that the flames received a great impetus because of the presence of quantities of slash from the lumbering operations.

This fire yesterday originated Wednesday evening about supper time when it started in one of the tents at camp No. 8, located at the lower end of the valley nearest the Elk river. Everything in the camp was wiped out then, but the 40 odd men stationed there experienced no further serious discomfort other than the loss of their personal belongings. From this the fire spread through the slashings and up the valley to the mountain sides. The men at camp No. 8 and additional assistance furnished by J. C. Hart, district forest ranger, were continually engaged in fighting it until noon Saturday, when it was believed to have been extinguished and strict vigilance not deemed necessary any further the men were allowed to get a well deserved rest.

Within one hour, however, a terrific gale rose and fanned some hidden embers into flame with such rapidity that in no time the fire was revived and utterly beyond control. The flames soared higher and higher and huge volumes of smoke rose high

above the surrounding mountains and were visible for many miles around.

*Climbed over Mountains*

At camps 12 and 14 about 125 men were employed. These were in the path of the flames and with their escape down the logging railroad entirely cut off, they were obliged to seek safety by traveling over surrounding mountains and beat their retreat cross country as best they could. Many were successful, but it is feared that at least 10 were overtaken by the fire and perished.

Within a large radius from the fire the heat was unbearable and while rescue parties and medical aid were rushed from here promptly great difficulty was experienced in getting near to attempt to release the trapped men and as far as fighting the fire was concerned, it was beyond human power. Many head of live stock were used in the logging operations, some of which escaped by being cut from the vehicles by the drivers, and being liberated some raced through the flames down the valley, the harness, manes and tails aflame.

*Tried Flight by Engine*

George Bronson was one of the engineers on the logging railroad. Apparently he had attempted to bring his engine down through the fire and escape in that manner, but fallen timbers obstructed the track and finding it impossible to proceed, he sought safety in the nearby creek, where he was found frightfully burned, with his head submerged.

Cavannia had been pinned down by a falling timber and burned to death. Pacquette was the most horribly burned of the bodies so far recovered.

Search parties are to-day operating through the fire swept area and a heavy shower last night has materially quenched the fire and also temporarily brought about a condition whereby the starting of fires will not be so great.

Apart from the loss of life the property loss to the Elk Lumber company will be heavy. The three camps are completely wiped out and it is said large quantities of logs and material also were destroyed. This is extremely unfortunate, as this season is the first for three years that the large sawmill of that company has operated here, and the disaster yesterday will almost certainly result in all operations being suspended for some considerable time.

# *The Fire in the Crow's Nest Valley*

On Friday afternoon, July 20th, in the early afternoon a fire started at the head of the flume of the McLaren Lumber Company on Allison Creek in the Crowsnest district in the province of Alberta, close in the vicinity of a small sawmill which was erected at that point for the purpose of sawing materials with which to construct the flume. The forest ranger for the district in the service of the Dominion forestry branch, Mr. F. B. Boulton, got word of the fire about 1 o'clock and started in to fight it. The fire was then creeping up the Crowsnest Mountain and it had to be fought on both sides from Allison Creek and McGillivray creek. Men were got out from McLaren's mill and mills further east on the Crowsnest Valley and from the town of Coleman, and the fire was attacked from both sides, and by Sunday morning it was fairly well controlled although it had been impossible by that time to have complete fire lines constructed. Mr. R. M. Brown, the Forest Supervisor, and Mr. E. H. Finlayson, the District Inspector of Forest Reserve, also arrived and assisted in the organisation of the fire fighting. The wind began to blow very hard again and by afternoon a gale was sweeping through the pass, the result being that the fire got up into the tree tops and swept up the mountain side. In the evening the wind having dropped,

a night gang was started but could not accomplish much in the darkness, but at daylight a large shift was at work and during Monday fire lines were well under way and were completed on Tuesday, the fire being by that time well under control, and there has not been any further danger since that time. There is no definite estimate of the loss sustained in this fire as yet, but under the circumstances and with the conditions that had to be faced it was kept well under control and prevented from getting into areas of valuable timber. There were several hundred men at work and the cost of fighting the fire will be very heavy. No detailed enquiry as to the cause of the fire has been made as yet but it seems reasonably conclusive that the fire started in some way from the McLaren mill, illustrating that even among the people who are most seriously affected by fire, namely, the timber owners, there is not sufficiently effective action to prevent dangerous fires starting.

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*Some Fire Reports Exaggerated*

Earlier reports of damaging forest fires in North Western Ontario turn out to have been somewhat exaggerated. The fires reported from Sault Ste. Marie district, May 15th, when navigation was interrupted by smoke were on the United States shore, and not in Ontario. As is the case with many newspaper accounts based on statements of excited persons, the damage ascribed to the fire near the village of Hymens was overdrawn greatly. One newspaper version mentioned the wiping out of many settlers, with a total loss of $10,000. According to the ranger's report sent to the Department at Toronto, the private property damaged was a hen house and store, totalling $170.00. Furthermore, the ranger states that far from Mr. George E. Hymens having cause for complaint, as quoted by the newspapers, it was he who started the fire by burning marsh grass.

## STANDS OF RUSSIAN OAK

John Alberts, of the Allis-Chalmers Co., Seattle, who spent considerable time in Russia, says he saw the most magnificent stands of oak timber near Odessa, a port on the Black Sea. Many of the trees were six to eight feet in diameter. The timber stands in the Ural Mountains are very heavy, consisting largely of oak, with some scattering ash and other woods. Mr. Alberts visited Riga, where large quantities of Baltic pine are exported and where some large mills are operated.

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## PROHIBITION AND LOGGERS

*(From "The Timberman")*

Only a few short months ago the city rendezvous of the average logger in the Pacific Northwest was a short pace indeed from the corner saloon below the "line" in Portland or Seattle. A 25-cent room or even a 10-cent bed in vermin-infested dogging house served him well enough in the days gone by. His accumulated pay checks, often untouched from Christmas to the Fourth of July, melted at the bar like the proverbial dew before the rising sun Ten days to two weeks were often ample to reduce his roll to the last farthing.

The logger was easily "rolled" or "trimmed" out of the last remnant of his once tidy little sum by the leeches of the lower levels of society, were any left after John Barleycorn finished with him. A few days of such revelry usually sufficed to send him back to his camp with a bad taste in his mouth and a feeling of disgust.

With prohibition has come a new order of things. This year on the second "dry" Fourth of July we have observed the logger in the better class hotels up town, enjoying a room with a bath. He now dresses as well as his superintendent and even follows the latest whim in white collars. It no longer surprises us to hear that he is investing in agricultural lands, city real estate and municipal bonds.

As for the prohibition question, we see nothing more to argue about.

# Insurance on Timberlands

The natural sequel of organized forest protection has arrived. A company has been formed under the name of the Timber Lands Mutual Fire Insurance Company, with head office at Portsmouth, New Hampshire, to insure against loss or damage by fire on merchantable standing timber, young standing timber and plantations. It is the first mutual of the kind in America and was formed by leading lumbermen and those experienced in the handling of fire protection in the woodlands, after careful consideration of all available data concerning the average loss over protected areas. This field has already been entered abroad by stock and mutual companies and in the United States by stock companies.

Mr. S. Laurence de Carteret, formerly local manager of the Brown Corporation at St. Raymond, P.Q. is Treasurer and Manager, and Hon. W. R. Brown of Berlin, N.H. is President. Such able guidance ought to ensure a successful development. In the company's foreword appears the following:

"Placed on a mutual basis it not only enables policy holders to receive their insurance at cost but will act as a stimulant to planting and to long time management of woodlands, and will create a demand for adequate and continuous protection. It will also make timberlands a more desirable subject for loans and so liquidate capital, and create a more definite market for cut-over lands and plantations."

"It writes insurance only on tracts which are adequately protected from fire either by Forest Protective Associations, the State or the owner, and it will not accept tracts which contain or adjoin recent slashings or which are exposed to undue hazards.

"The amount of insurance written on any tract is governed by its location and value, no line being given on any risk in excess of that warranted by the assets of the Company. With this limitation timber may be insured for part or full value as may be desired by the owner.

"Merchantable timber is insured on the basis of its stumpage value **per thousand feet** or **per cord,** and young growth and plantations on an agreed value **per acre.**

"Unless a definite value for the whole tract is agreed upon, both by the Company and the insured at the time of issuing the policy, the tract or section in which fire has occurred is appraised to determine what its value was before the fire as well as determining its value after the fire, to arrive at the amount of damage.

"The compensation paid is that proportion of the damage sustained which the insurance carried bears to the total value of the tract insured.

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## MANCHESTER AND TIMBER

Manchester ranks amongst the first order of ports in England for the importation of timber. Extensive accommodation is provided for handling and storage. These facilities, combined with the expeditious and economical methods of distribution, contribute to the steady expansion experienced in the imports: from 400,000 to 500,000 loads have been dealt with every year for some time past. Savings of from 3s. 6d. to 5s. 6d. per ton are effected by forwarding timber from the docks, as against the Liverpool docks, to most of the surrounding towns.

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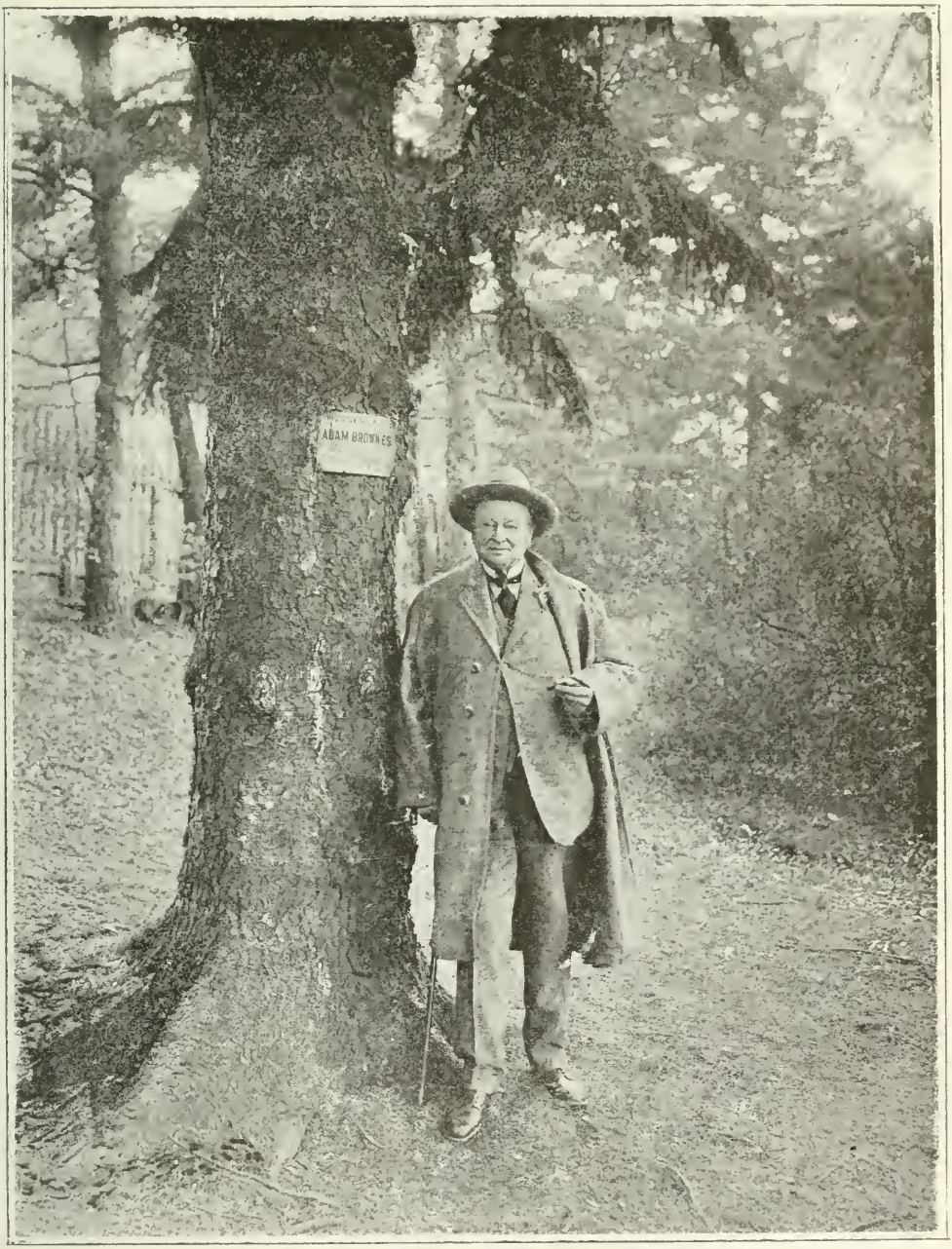
The Canadian Forestry Association is in receipt of a one dollar bill enclosed in an envelope by itself, intended evidently as a membership fee. The post mark on the envelope is indistinguishable; the address is type written in blue ink. The Secretary would like to know the name of the member to whom this amount should be credited.




HON. ADAM BROWN, Postmaster of Hamilton, Ont. standing beside a white pine tree which he planted 58 years ago—in the year 1859. At the time of planting, the tree was but a few feet high. Mr. Brown was then Chairman of the Water Commission of Hamilton and even with the lapse of time in which his tree has reached such giant size continues in vigorous health.

# What Birds are Worth to Forests

By W. C. J. Hall, Quebec.

## One Hundred Million Dollars is Estimated Insect Injury Yearly to Field and Forest.

Canada has a formidable contract confronting her since the passing of the treaty signed by Great Britain (acting for us) and the United States regarding the protection of migratory birds in North America. It should not be necessary to have a treaty at all, because it is in the direct interest of every man, woman and child that bird life should be fully protected, but unfortunately legislation and treaties are necessary owing to the fact that we all have been shamefully neglectful of our own interests, and in very many cases ignorant of them.

To demonstrate the necessity of bird life, one must first of all show what would happen if we had no birds—the foremost statisticians of the United States have stated over their signatures that if we had no bird life, no forests would exist on the North American continent in twelve years—if then the forests were thus obliterated by the onslaught of insects, owing to the absence of bird life, what would become of us; naturally man also would become extinct and that very rapidly.

As things stand at present, the best informed statisticians affirm that the annual loss in the United States to field and forest crops, is one billion dollars; in the Dominion, the loss is estimated at one hundred millions annually, all owing to injurious insects.

The only agency we have to check the devastations of the insects are the birds. A man can spray his trees in an orchard, or his potato crop in the garden, but if he is confronted with the task of looking to the whole of his farm in the same way, what could he do? Nothing! The case would be one of surrendering. Then take the forests, could any Government undertake to spray the forests? I trow not. The only way to preserve the balance of nature and let humanity survive, is to protect the birds and let them do the work. They charge nothing for it, it is their daily work, from morning to night. Some varieties of birds can and do consume their own weight of insects daily. With very few exceptions, they are all useful in one way or another and it is our direct and vital interest to see that they are not killed, captured, or even molested.

Any person versed in ornithology wil admit that birds take a toll of fruit, but compare the good they do with the small amount of depredations they commit, it is about in the same proportion to the damage done to field crops by the red deer and moose; they kept a record one year in Maine and established that some fifty dollars worth of crops were damaged by these animals. That is the proper point of view to look at the matter from.

### *Each Robin Worth* $10

Much as our existence depends upon bird life, still a large percentage of us are busily at work destroying the birds and especially, our alien population. These latter come from all parts of Europe, and finding they can carry arms without let or hindrance, they sally forth and shoot anything and everything. Massachusetts has just passed a law prohibiting aliens from carrying arms in the State—in New Jersey no one is permitted to use anything in the shape of an arm, except the double barrelled gun. They conclude that anyone so armed is sufficiently equipped for sport, and does not need pump-guns, repeaters, or automatics. But the aliens are not the only offenders, far too many of our young people destroy insecti-

vorous birds. It is estimated that each robin is worth ten dollars annually to the country, so when a young fellow goes out and kills fifty odd of these birds one can easily calculate the great work he did on that day. In the United States Dr, Hornaday, the best authority, asserts that apart from the grown up population who use arms, each twelve months sees at least 500,000 young men mature and go out shooting: will any sane person claim that under such conditions there is a fair chance of bird life surviving in sufficient quantity to hold in check the operations of injurious insects. In my opinion, it would be a good investment for the Dominion Government to buy wholesale, Dr. Hornaday's work, entitled "Our Vanishing Wild Life" and distribute it gratis to people in our towns and country places, as a preliminary educational measure to the masses.

### *A Monument to a Bird*

It would be easy to quote many instances of the tremendous utility of insectivorous birds in America, and on the other Continents, but just one will suffice for my purpose:—In the State of Utah, near the Great Salt lake, the black crickets arrived for three years running and utterly destroyed the grain crops. The people had to buy grain in neighboring States and fortunately could do so. The black headed gull made its appearance, found the crickets to its liking, and in a short space of time freed the country of the pest. The population have erected, or are about to erect, a monument to the bird which saved them from starving.

It is in the forest that the birds are of most irestimable value, they are the great and only agency which keeps in check the gypsy-moth, the bud-worm, the larch fly, the brown-tail, etc., etc. The parasite does good work too, but cannot compare in efficiency with the birds. Disease will not exterminate injurious insects, nor will the parasite, animals cannot do it, man cannot do it, there is no force innature which can control the insect world but the birds, they are the most indispensable balancing force of nature.

### *Bird Life and Forests*

It would be well for the Conservation Commission to take this subject up warmly, start a crusade for bird protection. They would find very able assistants in the women of the country. It would only be necessary to give one or two lectures in each town, city, or village, to enlist their services and start a branch Society for bird protection. This action would ensure a fair measure of protection in such places and their environs. The farmers should be interviewed and their true interests explained, they would look after that section of the country. There remains the forests—I wonder how many of our lumbermen have given any study to bird life and realize what it means: it must be a small percentage. Their efforts are confined to trying to keep fire out of their holdings, they have thought little of the insects and the birds. It is time they awakened to the true situation and lent their assistance to bird protection, thus helping themselves at an absolutely minimum outlay, for their fine rangers could placard the outskirts of their forests, and thus help to a very great extent.

### *Fire and Insects*

As between the damage done by fire and the insects let us see what figures tell us, and for this purpose let us take the Dominion only. We are told on the best authority that one hundred millions of damage is done annually to field and forest crops—well, for the sake of argument let us at one fell swoop assume that the figures are wrong, that only 50 per cent. of it is the correct amount, viz. —fifty million dollars, then let us assume that field crops are one half of this total, or twenty-five millions—let us proceed and cut the thing in half again and get down to 12½ millions. Without in the east asserting that the calculations of our exports are wrong, let us figure on the 12½ million basis, surely this is conservative. If we can assist in conserving such an amount, or the major

part of it, we are assisting materially in conservation of the forests. And how? Simply by leaving our feathered friends unmolested; we do not have to expend one dollar. The task should not be hard.

Jas. Buckland in concluding his pamphlet on "The Value of Birds to Man" says as follows:—"It is the nature of infamies, as well as of disease whose progress is not checked, to daily grow worse; and if the present day wasteful and depraved practice of denuding the world of one of its most valuable natural resources is not checked, then will be wrought a mischief, a universal disaster more awful in its results than words can express."

With the great war going on and the food being one of the most serious problems confronting the whole world, each and every one can help by protecting the birds, thereby protecting the crops and forests, and thus doing a "little" bit even if they do not go to the front. There is no time to lose if we want to see birds in sufficient quantity in the near future, and the present time is very opportune to take up the duty, for no other word than "duty" can express the situation.

# *Restoring War-Damaged Forests*

By Prof. A. Jolyet.

*Ecole Nationale des Eaux et Forets.*

The North East of France is a well wooded region and it is natural that numerous forests should have suffered as a result of the operations of war. However, though the damage incurred may have been great, it does not follow that the forests must necessarily be destroyed.

A forest is not merely formed by the sum of the plants living therein but also by the forest soil, or primitive soil modified by the existence of the forest, and by the sum of the plant and animal life there developed. The "etat boise" (wooded state) so produced represents a valuable capital and it would be a serious mistake not to utilise it as soon as possible, for this state or condition, though surviving the destruction of the forest population, does not last for ever.

There are two methods of regenerating a forest in these conditions: one natural and the other artificial. The former is not profitable, being too long, whereas the interest of the owner lies in obtaining commercial timber from his forest as soon as possible.

*Mutilated Trees*

The first point then to establish in restoring a forest damaged by war is whether the injured trees are definitely broken or merely bruised. In the first case they must be cut down level with the ground and, provided the species is a deciduous one and not too old, new shoots will then emerge from the stump. On the other hand, if the tree is a conifer, no shoots will be formed, but by cutting down the tree the danger of encouraging insect parasites will be avoided. In the second case also, felling is almost always advisable, for a mutilated tree is not likely to produce healthy wood.

As a result of the felling, gaps of greater or less extent will occur. These it will be necessary to fill up by means of appropriate species: (*a*) encouraging the natural reconstruction of the forest with wild species, or at any rate not impeding the same by an excessive amount of cover; (*b*) capable of furnishing within a short period good marketable timber the sale of which will enable the pro-

prietor to put back the forest in its original state.

*Filling in Gaps*

Next, the two following cases must be considered:

(1) *Gaps of large extent.*—When the removal of damaged plants leaves a very big gap, it is advisable to plant not merely a temporary but also a robust species with light shade in order to allow the reconstitution of the original species (oak, hornbeam, maple, ash, fir, etc.) The majority of pines fulfil these requirements, the Austrian pine is particularly adapted to a thin chalk soil; in sandy soil, on the other hand, Scots Pine does best; *Pinus Banksiana* Lamb, in spite of the small value of its wood is also recommended on account of its great hardiness which favours a quick recovery. As these species all require light, the plantations must be fairly thin, the trees 5 to 10 feet apart.

Clearings must then be made in succession and in this way, while obtaining an easily marketable product, the forest will eventually be completely reconstructed and rendered capable of again yielding marketable timber in its turn.

(2) *Gaps of very small extent.*—When the gap left by the removal of the plants is not above twice the height of the surrounding trees in size, the use of pines, which require a particularly large clearing, is not possible. However, as the object is to plant trees capable of early utilisation, there are other species of conifers answering to this requirement, and among these the fir and spruce are preferable. Though they give a very thick shade, the pyramidal shape of their summits will give the minimum of inconvenience to the surrounding trees, especially to the deciduous species. The fir is most advisable from the cultural point of view and the spruce from the commercial standpoint. At the same time, this would be the best way to establish the fir in forests of deciduous trees and could only add to the value of the forest as a whole.

# Forest Exhaustion a Peril to Canada

By Hon. W. C. Edwards,

IN AN ADDRESS IN THE SENATE.

## An Outspoken Warning Against the Illusion of Inexhaustible Timber.

"Now I am coming to a subject on which I shall not have sympathy in this Chamber and shall have comparatively few supporters in Canada. There are some men in Canada who have thought as much as I have on the climate conditions of Canada, her geographical construction, and her possibilities. You will be somewhat astonished, honourable gentlemen, at the statement I am about to make. I know of no other public man in Canada who would make such a statement. Not since Confederation has any public man made such a statement, but the reverse. On all our public platforms, in all our legislative halls, the statement has been continually made that Canada is a country abounding in a variety of natural resources which are of enormous value and inexhaustible. In my opinion this attitude has been more or less misleading and hurtful to Canada, giving her people an exaggerated idea as to her possibilities. Not only has Canada the disabilities due to her climatic condition and her geographical conformation, but she is not a country possessed of numerous natural resources. I make the statement advisedly, and I think I

know what I am talking about, and before many years have passed my statement will be found to be true. One of my friends, in talking to me before I arose to address this honourable House, said, "Edwards, don't be pessimistic." "Well, my friend," I said, "I will not be pessimistic, but I am going to tell the truth." Canada, as I have stated, is not a country of a great variety of natural resources She has just four, namely, agriculture, lumber, mining, and fishing; and a fifth might be added, namely, our water-powers. Occupying the northern portion of the North American continent we are naturally rich in water-powers.

*"Inexhaustible?"*

Coming to the next industry which I have named, that of lumber, I think it will be agreed that with this I am somewhat familiar. I do not hesitate to make the statement that every province in the Dominion of Canada far overestimates its resources in this respect. There are many in Canada who even to-day believe that our resources in this respect are inexhaustible and that it will only be a question of time until the United States will be exhausted of lumber and will have to turn to Canada for a supply. This idea, I assure you, is absolutely incorrect. The United States has as great a supply of lumber relatively to her wants as Canada has, and the total quantity of standing timber in Canada would not supply the wants of the United States for more than eight years. Canada was once a comparatively rich country in this resource, but bush fires and unwise administration of our timber resources on the part of the various provinces have brought about the unfortunate result I have named.

*Pulpwood in Danger*

In pulpwood we are considerably stronger than in timber for lumber manufacturing—of this there is no question; but, if our pulpwood resources are no better administered than our lumber resources have been in former years, they too will become exhausted much more rapidly than is at present anticipated.

*Bad Settlement Policy*

I would ask honourable gentlemen who travel through this country from Halifax to Ottawa, or farther west, just to observe as they pass over the various streams the logs that are being sawn to-day; for I assure you, honourable gentlemen, that the logs being sawn to-day in most of the mills in eastern Canada are such as were left in the woods twenty-five years ago, and I do warn the various provinces of this Dominion that, if we do not take care of our resources in this respect, the lumber trade of Canada, except west of the Rockies, will in a comparatively short time be a thing of the past. A stage was reached several years ago in the lumber industry, making it the continuous aim and object of every lumberman to conserve his resources in this respect; but they have not been supported by the administrators of the various provinces. Considerable portions of country are each year being sold for settlement where the object is not settlement but to obtain cheap lumber, on the part of illicit settlers and a certain class of lumbermen. To give evidence of this I could show to any one who would accompany me, say fifty miles from this city, in one single district from fifty to sixty farms once occupied by pretended settlers, but now, as all the timber is cut off, will be no settlers whatever. This condition of affairs, I assure honourable gentlemen has been most serious in so far as the timber resources of eastern Canada are concerned.

*Exaggerated Values*

In making the statements I do relative to our timber resources I do not want to pretend that we have not still timber resources of very considerable value, but I do contend that they are not nearly of the value which the average Canadian believes. With regard to the destruction of these resources, I quite admit that the provinces are not all equally guilty. In so far as fire protection is concerned, the provinces of Quebec and British Columbia have made the greatest strides in improvement in recent years."

# Conscripting Forests for Peace or War

## What Canada has done in utilizing her timber endowment—New duties after the War.

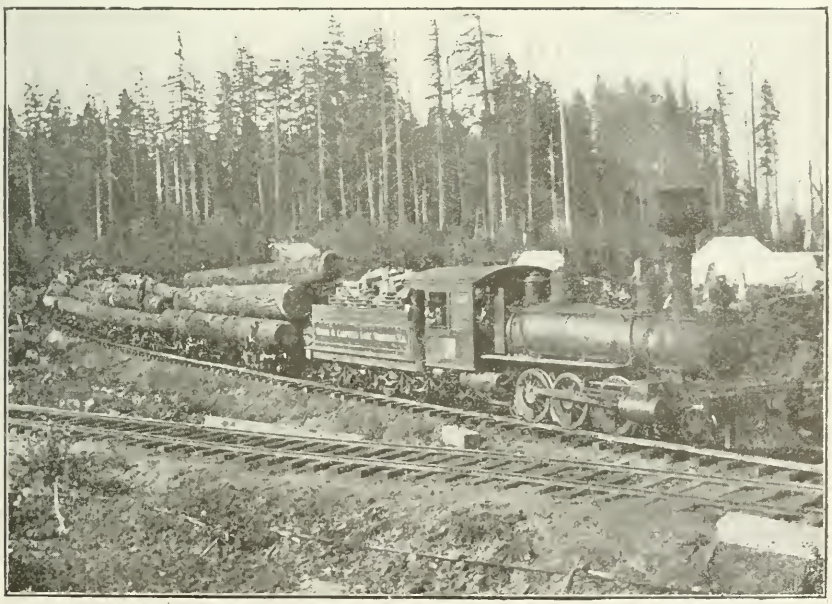
By Robson Black
*Secretary, Canadian Forestry Association.*

In these piping times of war the regiment is just one of a hundred fighting units. Every belligerent country, to a greater or less degree, "calls up" its railroads, factories, banks, farms, forests and mines and assigns them to the battlefield. Individuals and names mean less and less as the war grows old; the plan is everything.

This total concentration upon "the idea of science" in the conduct of the war is certain to extend to our national housekeeping when peace shall have returned. If the State can marshal armies and set them to work with such exactness and economy, why should not these same ends be secured in the peace-time warfare of field and forest, waterway and mine? That, at all events is the line of public thinking. Unless Canada is to be entirely crushed by the debts of war, the manner of operating the nation's natural resources in the interests of the greatest number of people must take its bearings by "the idea of science."

### *When Trees Were Weeds*

It is in the history of all new countries that the key of conservation is turned on an empty stable. As no new land starts business on a blue print of its future, preferring to work an elaborate cure rather than a simple preventive, it is not surprising that Canada during a hundred years should have victimized her forest resources by neglect and maltreatment There were days when French and English settlers shook their fists at every pine tree cluttering their agri-



BRINGING OUT BRITISH COLUMBIA "BIG STUFF."

cultural soils; days when a community blessed its stars when a million feet of spruce and hemlock went roaring to the skies in flame. We of 1917 are inheritors of that early misconception of the country's trees and their relation to the age we live in. With the French governors, only the finest of the oaks were accorded any value under the law, being reserved for the royal navy. With the coming of the English some of the pines of greatest size and most accessible for water carriage were further reserved for naval and bridge-building uses. By the time of the Napoleonic wars when Baltic exports to Britain were temporarily disarranged, Britain reached out for Canadian wood supplies, and in so doing laid the foundations of our great lumbering industry.

*The National Thief*

In the developing days of 1825, for example, one would not expect to find any rigid regulation of individual enterprise. Canada was too loose-jointed, too eager for any form of exploitation that would give a show of immediate wealth. Accordingly, the demand for timber from the United Kingdom and the United States was fed without stint and with a full-blown optimism. Splendid forests of white pine, our finest wood, fell, never to be replaced. Thousands of square miles degenerated to permanent waste. Fire, then as now, the great national thief, took ten trees to the lumberman's one. Only the mildest suggestion for fire patrol or suppression of loss ever emanated from government or licensee. So enormously did the present fact of a super-abundant wood supply overtop the thought of future depletion that "thrift" was as unpracticed as it was unpreached.

*The Forest Primeval*

In the Canada primeval, forests covered probably more than 1,200 million acres. Indeed, with the exception of lakes and rivers, the great triangular wedge of the prairies, the expanses of permanent barrens and the Indian settlements, the green mantle of tree life zig-zagged from ocean to ocean. Not until the lumbering industry became established did any sign appear that this rich bounty of Providence was a thing worth investigating and preserving. A few gingerly measures became law, mostly in the direction of personal arrest for starting conflagrations. Forest fires pillaged the country practically without hindrance and with not a little help. The Miramichi fire of 1825 cut a swath 80 miles long and 25 miles wide through the heart of New Brunswick, wiped out six towns, killed 120 people, 1,000 head of cattle, and an uninventoried mass of standing timber. That was spectacular because concentrated. But it has been duplicated in material losses time and time again since 1825, and indeed as late as last year when the Northern Ontario fires burned across 800,000 acres and killed 264 people, with a vast sacrifice of property. In Northern Manitoba one fire within the last 30 years ran for over 450 miles. In Northern Saskatchewan is an area of about 8,000 square miles, two-thirds as big as Belgium, fireswept almost to the point of permanent extinction of timber and soil. The burden which Canada has carried as a consequence of forest fires will probably never be computed because public sentiment in the past, vitiated by that pioneer indifference to tree values, kept no account and charged the whole business to the gamble of unpreventable events.

*Jack Canuck's Wood Factory*

But we Canadians have of late been listening to reason. We are not pioneers or colonials any longer. The national machine is putting on extra decks. From the first forest equipment of a pair of mitts and a broad axe, we have developed 5,000 wood-using industries. We ship spruce not only as lumber, but as rolls of finished paper. Indeed we are doing that so acceptably that, in 25 years, exports have jumped from $91 to over $20,000,000 a year. And $15,000,000 worth of timber goes each twelve months to John Bull. Then we make 800 million laths and three billion shingles, and our whole lumber cut annually exceeds three and quarter billion feet.

You can burn a candle at both ends, but not for long. You can strip a square mile of timber on the east side by the axe and on the west side by fire, but the axe will have short employment and the capitalist and workman and the public treasury will go light on profits. Every year we were adding to the export of forest products until timber has become one of our great trading staples in foreign markets. Every year, too, we have been exporting probably four to five million dollars worth of the living timber by the route of flame and smoke, from which no credit slip ever returns. To thinking people, the anomaly required a cure and by painfully slow degrees the same conclusion was crystallized into action by the timber-holding governments. British Columbia, Ontario, Quebec, Nova Scotia and New Brunswick and the Dominion Government (controlling all the lands of the prairies and 40-mile strip along the C.P.R. in British Columbia), formulated plans for fire prevention, and in some instances for a mild instalment of scientific forestry practice. Ontario led the way with a ranger service of some magnitude; this served well enough in its earlier days and is now undergoing reorganization. So followed the Federal forestry branch administering the extensive forests in the northern parts of the prairie provinces, and later the British Columbia forest branch, and then the rise of the four mutual protective associations of licensees in Quebec giving skilled fire patrol to 75,000 square miles of the best Provincial timber resources. As for the Maritime Provinces, well endowed with commercial timber, New Brunswick is about to adopt a modern plan of forest guarding, while in Nova Scotia, favored by a smaller fire hazard, the principles of prevention are already applied with good effect.

### *The Victory of the Tree*

This gradual ascent to what would seem the most elementary care and foresight in forest management is a clear-cut triumph for the tree. No amount of sentiment, no flood of remorse—nothing but the prod of good business—has put forest conservation even as far as it is. The tree stands forth as an absolute essential of the country's day-to-day existence. It furnishes the tools of the fishing industry. For every ton of coal taken from a Canadian mine it must supply six feet of timber for props. No railway can run a yard without the tree for ties, coaches, buildings, fencing. No fewer than 500,000 track ties must be taken from our forests every year as renewals on the Canadian Pacific road alone. The same line uses 50,000 telegraph poles a year and 60,000,000 feet of lumber.

### *The Printed Page*

Consider the newspaper. The tree is the link between editor and reader, between the news of the world and the eyes of the world. Two hundred spruce trees go into one edition of a Montreal newspaper and a New York paper obliterates 15 acres of spruce and balsam forest with a single Sunday edition. Look into agriculture! Of what value is land without a farming plant—a wooden house a wooden barn, fence posts, implements, wagons furniture, fuel? And hydro-electric development! Forests are the guardians and regulators of the streams, the deep spongey masses of the "forest floor" acting as nature's reservoir for the excess waters of spring. As everyone knows who has seen a flood or felt the pinch of a drought, a river at e ther extreme is serving an evil and extravagant purpose, and yet an unruly river can too often be traced clearly to an unruly forest. Wreck a watershed forest and you wreck the gold mine of water power and irrigation development.

The tree gives employment to 110,000 Canadian men in more than 5,000 factories. It distributes more wages, attracts more capital and uses more human labor than any other industry we have with the single exception of agriculture. There are towns in Ontario and Quebec where the company that built the paper mill in the middle of the wilderness also created an entire municipal organization, streets, houses, picture theatre, playgrounds, town hall, police station, churches and

schools, as was indeed necessary to retain employees.

*What Next From the Log*

But lumbering, as has been shown by references to fisheries, mining, agriculture and water powers, is but one department of forest utilization. Mankind is only at the commencement of new uses for the common log. Indeed in so many hundreds of ways is wood in its various forms now employed that mention of a very few will suggest the high reward for future research and experimentation.

One might, for example, step into a drug store with an armful of prescriptions and have them filled without departing from the derivatives of the tree. Barks without number, quinine, chinchona, etc., turpentine, balsam products, chloroform, camphor, cough syrups, corks—the list would take the bottom out of the pharmacoepia. Wood pulp is producing not only paper, but waterproof clothing, vests, mattresses, blankets, twine and dish towels. The Germans are using a mixture of treated hemlock bark and molasses to feed their dogs, and all European countries have long employed wood wool, a fine excelsior, for surgical dressings and mattress filling. In no war in history have timbers played such a part in defensive construction, the durability of trench and dugout depending wholly upon wooden props.

*Good Uses for Sawdust*

The despised sawdust is an essential ingredient of blasting powders, porous bricks, metal polishes, floor sweeping compounds, inlaid linoleums, and as fuel. Hemlock and oak bark is used for tanning leather. Beechwood shavings are a necessity in vinegar factories. One might proceed after this manner narrating how prolifically the tree and its parts contribute not alone to the obvious purposes of lumber manufacture, but to hundreds of industrial processes from the making of oatmeal wallpaper to supplying solvents for high explosive fibres. In place of steel and concrete substances pushing the tree from the market our employment of wood is increasing enormously. Its marvelous adaptation to the needs of primitive or civilized life, its ability to take a multiplicity of forms (as in the varied and unrecognizable products of pulp fibres), and the seemingly endless possibilities of wood distillation, and perhaps most important of all, the relative abundance of growing timber, its accessibility and cheapness—these have rendered the tree, were we to give the matter a moment's thought, one of the mightiest benefactions of Mother Nature. It is geared to farm and mine and factory and all the wheels of our commerce and finance. Whatever relates to the wood supply, therefore, is the immediate business of every moving item in the machine.

In India the original Moguls owned all the land, and every subject of the scores of millions accepted the Mogul's say-so and paid tribute. That system with modification, has effect to this day. In Canada, whatever blunders we have made as stewards of the natural resources, our original law-making moguls saw to it that the title to over 90 per cent. of the forested land of the country should remain perpetually in the name of the people. Of course, much of the timber growing on that land is licensed and put to sensible use in the lumber and pulp-mill, but the governments have retained the ownership of the grounds on which the timber grows and thereby possess the right to impose whatever regulations the conservation sentiment of the country may demand. That is a great power and should be jealously guarded as it should be moderately exercised. How fortunate Canada is in her public control of the timber land is appreciated perhaps better in the United States, where only about one-fourth of the public forest domain is subject to State or Federal regulation. Four-fifths were long ago alienated by thoughtless administrations.

As in the early days the dismayed farmer reviled the forest as a barrier to the plow, that sentiment maintains its strong reactionary grip on this generation. We also kill wood-peckers and robins, frogs and snakes, from the same inbred prejudice unenlightened by the shy truths of the modern investigator.

*What Conservation Means!*

Conservation of forests means that every acre of ground in the Dominion capable of growing field crops shall be delivered to the agriculturist when required. Trees cannot give as good profits as annual wheat harvests when the soil is favorable to the latter. But more than 60 per cent. of the whole of Canada will never produce farm crops. The conditions of soil, climate, topography, render that 60 or more per cent. unfit to take the plow or spade. Except in pockets it would not pay the settler his salt. Much of it is permanent barrens, as in Ungava, and in streaks of every county north or south. Conservation of these enormous non-agricultural tree-growing areas—about 500,000,000 acres—means that where a farm crop is impossible a timber crop shall be assured. Why not? Timber will grow, within climatic limitations, almost everywhere. Saskatchewan, for example, is a prairie Province except on those millions of acres where it is emphatically a forest Province. Seventy or eighty per cent. of its northern tree-covered soil will never pay dividends to agriculture for reasons that time or tide cannot alter. The rule of efficiency (synonym for conservation) requires that the bulk of Saskatchewan non-agricultural soil shall be regarded as a rich Provincial inheritance and that fire shall be rigidly excluded, as a man excludes it from his houses and barns. More than that, the law of good house-keeping to which the war has seemingly committed us, means that the exact science of forest management shall be applied so as to endow the Saskatchewan of 1997 with even better forests than existed half a century ago before the carnival of fires.

*The Fire Enemy*

Forest fires have bullied and impoverished Canada for more than a century. While European nations circumvented the damage of flames by determined and successful means, 50 to 100 years ago, we remained the victim of boyish delusions about the helplessness of man against the terrors of Providence. We are learning very late but very willingly that fire damage in the precious forests can be ousted. Methods of prevention and of fire fighting have become more or less standardized the world over, and are available to any Government or individual who cares to ask questions.

# *The Deadly Manzanillo*

By Frank Coyne
*In "American Forestry"*

Literature on the tropics abounds with stories of poisonous plants and trees, and to this beautiful tree, arching many a roadway with its glossy green leaves and rose-tinted flowers, has been ascribed the deadly poisonous properties of the far-famed Upas tree of the East.

To the fruit of this tree, more than to the effect of its foliage, is due its evil name. Manzanillo in Spanish means "little apple" and in the Papiamento tongue of the blacks of Curacao, Dutch West Indies, living in their little thatched huts, the name Manzanillo is pronounced but slightly differently from the Spanish.

It has been stated by Spanish writers that if one remains under its shade for a few hours or sleeps there death is likely to follow, or that even if the unfortunate escapes death the body will become a mass of running sores. The deleterious properties of the shade of this tree have, however, been greatly exaggerated, and as for the actual poisonous effect of the leaves and shade considerable diversity of opinion still exists, as is the case with the poison ivy of the States.

The small, apple-shaped fruits have tempted many a stranger to a much-regretted meal. As recently as the summer of 1916 an officer of a Dutch steamer had a narrow escape from serious poisoning, emetics and stomach pumps alone saving his life. Some 32 years ago 54 members of the crew of a German ship were taken to the local hospital, all very sick from having eaten the fruit of the Manzanillo. Five of this number died and the rest after serious illness for several weeks recovered.

As is the case with the question of the leaves and shade, there are many accounts of the effect of the fruit. To quote from one writer "A fish which eats the fruit becomes infected, the gills becoming yellow and black, and one who eats the fish in this state is said to fall into a profound lethargy, with a general relaxation of all the limbs, according to the amount eaten."

The tree when cut exudes a quantity of white, milky juice, in the same manner as the common rubber-tree, and to most persons this juice has the same effect as our poison-ivy. However, if this acrid milky juice reaches the delicate membrances of the eye, temporary and often permanent blindness is sure to follow.

The Manzanillo is a native of the West Indian Islands and is usually found in moist situations.

# "Fifty Years" or Five Hundred?

## Will Current Estimates of Forest Exhaustion in Quebec be Permitted to Come True?

The value of Quebec's exports to the United States last year, including paper and manufactures of paper, pulpwood, lumber, lath, shingles, sulphate and sulphite pulp was $16,264,382.

That enormous sum showed an increase of five million dollars over 1915.

The sales of Quebec to Uncle Sam last year included more than 212 million pounds of news print paper, 359,507 cords of pulpwood, rough, peeled, and rossed, over 91 million feet of lumber, rough and planed, over 37 million laths, 162 million pounds of mechanically ground wood pulp, 130 million pounds of sulphate pulp, 32 million pounds of sulphite pulp.

Such tremendous and increasing pressure upon the forest materials of Quebec cannot be withstood indefinitely unless some measure of scientific forestry is given the right of way in all woods operations. At the recent session of the news print and sulphite "probe", before Commissioner R. A. Pringle, K.C., statements were entered by several witnesses, managers of pulp and paper companies, that they were reckoning upon the depletion of their limits in periods ranging up to *fifty years*. Some estimates are known to be placed at twenty-five years.

Is it conceivable that companies with millions of dollars invested in an immovable plant will publicly admit their belief that the investment is headed for the scrap pile and yet take no measures to forestall the calamity. No pulp mill, or large lumber mill, is any more permanent than its limits. It is an anchored investment. If the wood supply is insufficient or too distant, there is no recourse other than insolvency.

It is not too late to introduce into the woods operations some degree of scientific method, such as, curiously enough, most managements are glad to apply to the industrial superstructure without much thought to the foundation of the log supply.

The Quebec lumber and paper companies cannot afford to have some

of the predictions of forest depletion, heard at the Newsprint Inquiry, come true. The Government of the Province can even less afford to have 1967 witness the extinction of an industry that can sell by export to the United States alone over sixteen million dollars worth of goods, and that supplies a livelihood for scores of thousands of citizens.

# THE WORLD OVER

## TAPPING TREES FOR RESIN

The Batjan Sultanate, which is bound by contract to the Government of the Dutch Indies, includes islands situated right in the east of the Indian Archipelago. In these islands are found trees which, either by natural secretion, or after preliminary treatment, yield the "damar" resin used in Europe in the manufacture of varnish. These trees nearly always form forests of a fairly wide area and exude "damar" naturally. Sometimes even it is found buried in the soil, where it has collected from trees which have disappeared.

Only the *Agathis* is treated artificially to stimulate the secretion of resin. The natives make an incision of 30 cm. at man's height, then another 60 cm. higher, and others the same distance apart. Care is taken only to cut half of the bark, leaving the rest intact. The "damar" flows slowly from the incisions and, after some months, large balls of yellow, very clear resin form. The "damar" thus collected has a greater value than that scraped from the bark, in which are always found bits of the bark and other impurities. After the resin has been collected the wounds are cleaned and scraped, and, after 1½ months, there is a new flow.

## FOREST MANAGEMENT IN MOROCCO

From a French Government report on agricultural organization in Morocco, the following information is obtained as to the Waters and Forests Department in Morocco.

This Department, started in 1913, could only be organized in 1914, and although the staff was considerably reduced (2 superior officers and about twenty officers and French forest-guards), the result of the first working year (1914-1915) may be considered as encouraging as, the receipts have almost equalled the expenses. The magnificent forest of cork-oaks at Mamora, rapidly being destroyed by the natives, has been put under regular control. The cork from 120,000 feet has been utilized in 1914-1915, and up to the present the control of two other forests has been organized.

In addition, about 60 miles of fire lines nearly 100 feet wide have been opened out; in 1915, three groups of ranger's houses were established, and 4 others in 1916, at the price of 25,000 fr. (£988) per house, each capable of accommodating the guard's family as well as the native staff and also suitable as a store, etc.

## TREE CULTURE IN URUGUAY

The Uruguayan Government seeks to encourage tree planting, and the National Nursery has supplied trees at a very low cost. In compliance with a recent decree, the nursery will in the future donate large numbers of trees. The decree provides that proprietors possessing up to 100 hectares (247 acres) of land will be supplied gratuitously with 100 trees and that the nursery can distribute 200,000 trees every year in this way. The nursery will also donate in 1917, 100,000 and in the following years 200,000 trees to rural municipalities, schools, police farms, and other institutions.

## PULP FROM BANANAS AND PINEAPPLES

Pulp made from Blady grass, or Lalang:—In Queensland this plant grows wild and produces 4 tons to the acre on good land. Four tons will produce (according to its dryness) 1½ to 2 tons of pulp and this is worth £8 per ton.

Triumfetta and Urena Pulp.—The whole plant can be converted into pulp, but if the fibre is taken, the balance can be made into pulp. Three tons will make 1 ton of pulp.

*Sida retusa* Pulp.—This makes a very high class paper, suitable for bank notes and legal documents.

*Pulp from Cane Top.*—Makes excellent paper, especially blotting-paper.

*Sugar Cane Megass Pulp.*—As fuel megass is worth 5s. per ton, but for paper making it fetches about 12s. 6d. to 15s. a ton delivered.

*Banana Pulp.*—After fruit-bearing, the whole plant can be manufactured into paper pulp. The paper produced is of very high quality. It takes 5 tons of banana stems and leaves to make 1 ton of pulp which is worth £10.

*Pulp from pineapples*, (which yields ¼ of its green weight of high-class pulp), *Hibiscus* sp., Bamboo.

(Report of International Institute of Agriculture).

## FOREST MANAGEMENT IN FORMOSA

According to a report of the British consul at Tamsui, special attention has been given of late years by the Government to the intensive management of the inland forests of the Island of Formosa.

The wood from the forests of Mount Ari has been largely utilised since 1915, when wood from the Arisan forest was first exported. About three million cubic feet are obtained annually from this forest. The most recent and improved methods are used, and the wood is sent to the Kagi timber-yard in logs.

The Kagi timber-yard is near the starting point of the Arisan railway, which runs along the mountain side for a distance of 41 miles. Aerial transport cables have been fitted up which allow a yield of from 10,008 to 11,400 cubic feet per 10 hour day to be attained.

Two new forests suitable for working have been found in other parts of the island. One of these is in the Taichu prefecture, on the slopes of Mount Hassen, the other is in the Giran prefecture, in the upper reaches of the river Daidakusuike near Mount Sansei.

Attempts are being made by the forestry department to develop the management of the Formosan forests to a still greater degree.

According to the latest estimates the area of the Hassen forest is half that of Mount Ari, whereas the forest in the Giran prefecture is 1½ times as big as that of Arisan.

The great transport difficulties at Arisan, where a railway had to be built, do not seem to exist for the two new forests. In this case there are water-courses down which the logs can be sent either to the coast or to the railway.

## REPLACE STEEL WITH WOOD

Advice has been sent out by the National Chamber of Commerce to manufacturers, builders, and others to substitute wood and other materials for iron and steel when it can be done. The reason assigned for this course, according to *The Hardwood Record* (Chicago, July 10), is that steel and iron are needed in such large quantities in prosecuting the war that enough to meet the ordinary needs of other business can not be depended upon, but wood is available. The paper just named goes on to say:

"It is fortunate that we have our forests. It is a resource which will serve the country well in this crisis. The need of timber is so great in some of the

countries at war that almost a clean sweep is being made of all trees. That is true particularly in England, Scotland, and parts of France. Ornamental groves, shade-trees, and private timber of all descriptions are being cut to meet the call from the front. Nothing is spared for the sake of sentiment. It is an emergency that recalls Shakespeare's question: 'Who in a sea-fight ever thought of the price of the chain that beats out the brains of a pirate?' The American forests are able to meet the call. The war can not last long enough to exhaust our timber, even after using it as a substitute for steel wherever possible There is enough iron in the ground, but it can not be mined and manufactured fast enough to supply both war and private business; but fortunately, there are timber enough and reserve saw-mill capacity sufficient to take care of the needs of the country in this emergency. It has been a subject of comment, and often with a note of discouragement, that too many sawmills had been built. If they operated to capacity, there was danger of an over-supply of lumber. Perhaps the day is at hand when it will be considered fortunate that there are so many mills, and that they are able to speed up production almost without limit."

## *The Diplomatic Forest Ranger*

The work of a Forest Ranger or Guard during the fire season is, of course, taken up very largely in preventing fires, writes W. G. Morison in "American Forestry." Since the greatest danger is from campers, hunters, and fishermen, who through carelessness or ignorance throw down lighted matches, cigarettes, etc., or build camp fires where they should not or go away leaving them burning, it is essential that they be warned, and it is equally important that they be warned in such a way that they will not take offence. I have known campers who have been left in a very antagonistic frame of mind by being told in a tactless way to be sure and not start a fire, and how not to start one, the law for such offence, etc., and consequently did not care much if one did start, and certainly would not have helped fight one unless forced into service by reciting the law to them, which is worse than not having them at all.

It is very easy to get the co-operation of most of the people who come into the woods for recreation (the natives of the woods usually are as anxious as the Forest officers to prevent fires) by several little ways without even letting them know that you are trying to do so, for instance: a Ranger or Guard sees a fisherman; he goes down towards him, and when he sees that he is seen, he incidentally tells the fisherman thereby who he is, and probably has him thinking unconsciously of fire already. Having done this, he goes up and says, "Hello, had much luck?" and then engages in a conversation as to the pros and cons of fishing (no better

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way to please a man than by talking about the thing he is interested in at that particular moment). During the conversation he glances around as if looking for smoke (remember the idea is to get the fisherman's mind centred on smoke, and smoke means fire). After a while he says, "Well, I guess I will have to be getting on, pretty bad time for fire." The fisherman then probably says something such as "Had many this year?" or 'Has there been much damage done around here?" This gives the Forest officer the opening he is looking for, and he says, "No, not so far. Have been mighty lucky in having 'old timers' around who realize the damage done by fires and are careful. You can spot them every time. Now, I can see you are far from a green one in the woods from the way you handle your rod and line," or anything like that to flatter him. If he is an "old timer" he will admire your powers of observation: if he is not, he will be tickled to death to think that a Ranger, who is supposed to be the best of woodsmen, could not spot him, and his chest will bulge out considerably. In either case the Ranger has pleased him, and the chances are one hundred to one he will have no trouble with that man starting a fire. On the other hand, suppose the fisherman does not give him an opening: in that case, the Ranger stops and says, "By the way, did you see any camp fires coming down the river?" The fisherman says "No." Then the Ranger, "I certainly would appreciate it if you would put out any you see burning. We have some people who come up here who are not used to the woods, and naturally do not realize the importance of putting out their fires or that a little spark from a cigarette or match is very dangerous." The Ranger has now warned the fisherman by pretending to be worried about others, and at the same time pleased him by pretending to think the chances of his being so careless are so remote that it is unnecessary to warn him. The same mode of procedure applies to hunters and campers. The Ranger can always bring the conversation around to his work, and, by a little tact and politeness, go away resting assured of the fisherman's, hunter's, or camper's co-operation.

Suppose he has come on to some campers: he walks in, not forgetting to be looking for smoke, and after the usual day's salutation sits down. After talking about things in general, he gradually brings the conversation around to cooking in the open. Most of them will have some opinion as to the best way. Of course, he will be supposed to give his ideas on the subject. He might say something like this: "Personally, I think a stone fireplace is the best. It makes a cracking place to cook on (all the time he is showing them how to make one), and if you bring along a piece of sheet iron to lay on the stones you will have a regular stove, or should you forget the sheet iron (the chances are they have none with them this time), you can easily make the fireplace narrow enough to rest your frying pans on the stones, and then, too, a fire of this kind is not so apt to start a forest fire." Then he has the conversation started on forest fires, having told them of the fireplaces, which is important. He now has them in a good state of mind, and their attention his, and he can tell them lots which ordinarily would go in one ear and out the other. I personally have tried these ways of inciting the interest of the users of the National Forests, and found they never failed to bring good results.

---

The Manager of Eastern Lands of the Canadian Northern Railway has just returned from a trip through Northern Ontario and says that he believes that there are tributary to the present railways and waterways leading to them, 250,000,000 cords of spruce pulpwood in Ontario and 350,000,000 cords in Quebec. He says that it is useless to consider timber north of the Transcontinental Railway, as the rivers run north, and only a small portion could be brought 'upstream by building dams which would enable the wood to be towed back.

## THE FARMER AND HIS SPRUCE

We have been preaching conservation until our utterances have become prosaic. Settlers in a new country could not live on spruce that had no value. They must till the soil, so perforce did burn the forest, their fires of course, spreading in devastating ruin. And now, paper has risen to a price commensurate with the value of spruce, so that the owner of standing timber is spoken to in commercial terms affecting his personal wealth, and be he farmer or lumberman, the conservation of his spruce at so much per cord has a meaning more forceful and obvious than all the polished phrases of our most ardent conservationists.

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The silo originated in the southern part of Europe somewhat previous to 1845, and there are five or six still standing, have done constant service and are made of wood.


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# Britain's Task of Restoring Her Forests

## United Kingdom Spent Forty Million Pounds on Imported Wood. A Home Supply Essential

Will the British Government undertake the replanting of great areas in timber after the war in order to overcome the embarrassments and dangers of almost complete dependence upon imported wood?

The Royal Scottish Arboricultural Society has sent in a report to the Reconstruction Committee of the British Government on the subject. Parts of it of special interest to readers of the Journal are as follows:—

1. *Need for Action by Government*

After the reports of a Royal Commission on Forestry and of more than one Departmental Committee on the subject, it would be superfluous to discuss either the need for further afforestation, or the duty of the Government to assist in the work. The simple fact that we spent more than 40 million pounds in 1913 upon imported wood, is sufficient to show, both the enormous extent to which the home-grown supply falls short of our requirements, and the impossibility of expecting private effort to make up the deficiency.

The question has attracted a good deal of attention in recent years, and all who have studied it have been struck by the great loss which the nation suffers in paying away to foreigners immense sums of money which might be retained in the country for the benefit of its own people. And since the war began we have had occasion to feel that our reliance upon foreign countries for such a large proportion of our timber requirements is not only a material loss but a source of danger.

*Wood in Civilized Life*

How dependent we are upon wood is, perhaps, not sufficiently appreciated. It is not too much to say that civilized life could not go on without it. The amount required by railways, collieries, and other vital industries is gigantic; and to these must now be added the enormous consumption of wood in modern warfare. To induce the Government to embark upon a policy of afforestation stress is often laid upon the fact that national forests would prove a source of revenue. Judging from the published accounts of French and German forests, and from the experience of landowners in this country whose woods have been scientifically managed, there can be little doubt that this would eventually be the case. But it is not on this ground that the decision of the Government should be based. The true justification for national afforestation is the well-being and security of the country. Wood is one of the prime necessaries of life. Next to food, it is the article of which an abundant supply is most essential to the nation. It is on this ground that foreign governments have recognised their responsibility in the matter; and it is on this ground also that we hope our Government will decide to do the same.

*Every Acre Made Efficient*

The country has been informed that it is the intention of the Government to make every available acre of land productive. This can only be done with the aid of afforestation. There are, no doubt, thousands of acres of agricultural land, now neg-

lected, which are capable of being profitably cultivated. But beyond these, there are millions of acres of waste land capable of being profitably planted. Unless the Government will assist in planting them, one of the greatest natural resources of the country must remain undeveloped.

The benefits of national afforestation may be summarised as follows:—

1. It would turn many barren wastes into profitable woodlands.
2. It would retain, in the rural districts, thousands of men who now have to seek employment in the towns.
3. It would keep in this country, for the benefit of the country, millions of pounds now paid away to foreigners.
4. It would enable a large number of small holdings to be established on economic lines.
5. It would lead to the development of many new industries.
6. It would ensure such a supply of timber as would enable British industries to be carried on, without curtailment and without anxiety, in the event of another great war.

### *State Afforestation*

A preliminary point to settle is the extent of afforestation which would be required. It would be quite possible to make the country self-supporting in the matter of timber. The reports of the Royal Commission and Departmental Committees show that the amount of available land is more than sufficient for the purpose; while competent authorities assure us that our soil and climate will produce every variety of timber in common use, and of a quality equal to that which comes to us from abroad.

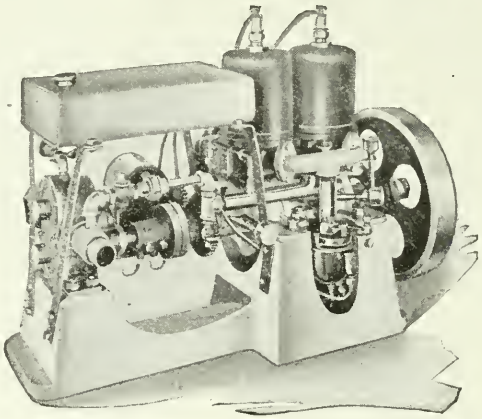
It would not be necessary, however, to make ourselves entirely self-supporting. It would probably be sufficient to make such an increase in our existing woodlands as would substantially diminish the amount which we now pay annually for imported timber, and enable us, in the event of another great war, to carry on for three years without unduly depleting our home supplies. To ensure this our present woodlands should be increased by 2 million acres. The wooded area of the United Kingdom is estimated at 3 million acres: it should be increased to 5 million acres.

The annual consumption of timber in the United Kingdom before the war was about 650 million cubic feet. Of this amount only about one-eighth was grown at home. Under an improved system of silviculture the existing woodlands in the country would yield fully twice their present output. The additional 2 million acres, scientifically managed, could be counted on to yield 150 million cubic feet. We should thus obtain from the afforested land in this country something over 300 million cubic feet annually, or one-half the volume of present consumption instead of only one-eighth.

We do not say that an addition of 2 million acres to the area now under timber would fully meet the needs of the country, especially when we remember how the demand for timber has steadily increased; but we consider that this is the lowest figure which should be aimed at in any scheme of national afforestation.

### *Joint Action Needed*

Afforestation should be carried out, partly by the State, and partly by private owners of land. There is no doubt that the work would be more cheaply done if landowners were encouraged to take a part in it. In the first place, where the work was done by landowners, the State would be relieved of all expense connected with the purchase or leasing of the land to be planted. And in the second place, owners already possess much experience in planting and managing woods, and they employ a large number of men trained in the arts of forestry. It would obviously, therefore, be an advantage to associate landowners, as far as possible, with any scheme of afforestation. The extent of afforestation contemplated is, of course, too large to enable them to undertake more than a limited share of it. But it would



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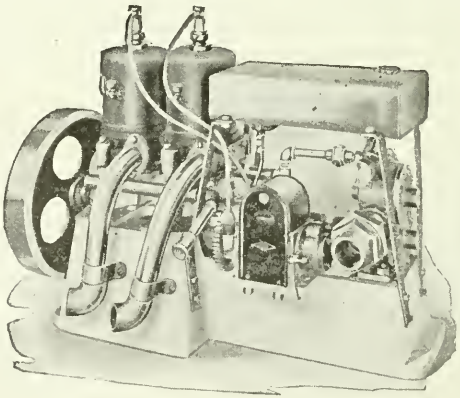

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be worth while for the State to offer inducements to them to make the share as large as possible. These inducements should take two forms—(1) the removal of discouragements to planting; and (2) the offer of substantial encouragements.

*Some Discouragements*

The chief discouragement to planting is due to the burden of imperial and local taxation These two combined always amount to a very large proportion of the annual value of the land. At the present rate of taxation they often exceed 20 shillings in the pound, as can be proved by concrete instances. Such instances no doubt include super-tax; but it must be remembered that super-tax will invariably be payable on estates where planting could be done on a large scale. Unless this burden were lightened, it would not be possible for landowners to take any considerable part in the work of afforestation.

# *French Addresses at Quebec Centres*

By the kind co-operation of the Minister of Lands and Forests, Quebec, the Canadian Forestry Association was enabled to secure the services of Mr. Avila Bedard, of the Laval Forest School, (also of the Department of Lands and Forests) for a series of French lectures in the Province of Quebec. A route was arranged so that Mr. Bedard would meet the public at about twenty-five points and discuss with them the problems of forest protection, asking their co-operation in maintaining the source of raw materials for all time to come. Advance publicity was arranged for, and the series was commenced at Grand 'Mere on Thursday, August 2nd, before an excellent audience. Mr. Bedard, who is a graceful speaker, covered his subject in popular style and held attention closely. At the close of his address, about one hundred and fifty stereopticon pictures, mostly in colors, were projected on a screen and explained. The pictures included scenes in the war zone, forest rangers at work, the forest industries, problems

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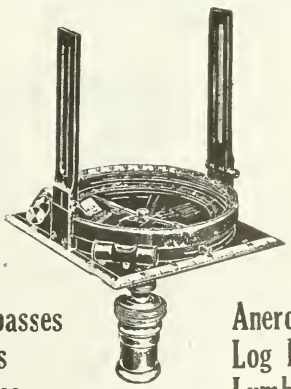

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of erosion and timber denudation in foreign lands, results of settlement on non-agricultural soils, etc. in which the audience was heartily interested.

At St. Gabriel de Brandon, the following evening, the town hall was filled with men and senior boys, who gave splendid attention and undoubtedly enjoyed and profited by the event.

Other points in the itinerary to be covered in August and September are: Shawinigan Falls, Three Rivers, Windsor Mills, Stoke Centre, St. George, St. Jovite Village, Annonciation, Ste. Agathe, four points on the St. Francis River, Chicoutimi, La Tuque, St. Raymond, and probably other points. The lectures are entirely free to the public.

## YOUNGEST MAJOR A FORESTER

One of the most interesting personalities to be found in the long list of forest engineers and forest assistants who have gone overseas is that of Major G. Roland Barnes, M.C. who has been on furlough at his home in Hampton, New Brunswick. "Shad" Barnes, as he was shown in the sophomore 1917 class at the Forest School of the University of New Brunswick is the youngest Major in the Can-


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adian Army and won the military cross and bar, plus promotion, for intrepid conduct.

---

Mr. Jas. T. Blackford, the Chief Fire Ranger for the Dominion Government in Northern Manitoba, reports that on the night of July 23rd an electric storm of a very severe nature, unaccompanied by rain, passed over his district and was the cause of numerous fires starting up all over the district. The next morning Mr. Blackford saw the smoke and on going up the lookout tower could see nine fires started. It was not more than 30 minutes between the time he first saw the smoke of one fire until he could see the smoke of nine. For the next week he was busy day and night, only taking sleep as he travelled by canoe. He was at three of the fires in person and had gangs of men at each. By the end of the month all the fires were reported out except two which were being steadily fought. None of the fires as yet reported on were started by campers. All appear to have been started by lightning.

---

If you see a sign of fire on or near a railway right-of-way, don't underestimate what it means. Inform the nearest fire patrolman or station agent. Lend a hand yourself. Throw away neither burning matches, pipe ashes, cigarette nor cigar ends.


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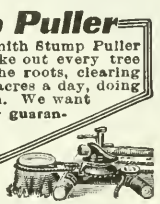

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## Department of Lands and Forests

Quebec, 2nd June, 1917.

Public notice is hereby given that, in conformity with the law, on the 21st August next, at 11 o'clock a.m., at the office of the Minister of Lands & Forests Dept., Quebec, there will be offered permits to cut timber on lands belonging to the Crown in the Upper-Ottawa, Lower-Ottawa, St. Maurice, Lake St. John, East and West, Saguenay, Rimouski West and Bonaventure West agencies, comprising several large blocks in the Abitibi, Upper-Ottawa and head waters of the St. Maurice and Gatineau and on River Chamouchouan.

Permits will be adjudged to the highest bidder.

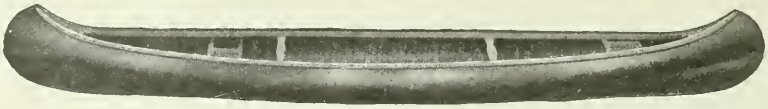
The price of adjudication is payable in 3 equal instalments.

The permit to cut will be subect to the ordinary conditions of the Law & Regulation and the grantees of any of the aforesaid territory must, within a delay o three years, manufacture, in the province of Quebec, with the timber cut in said territory, either pulp or paper in the proportion of ten tons per day, or sawn lumber in the proportion of ten thousand feet board measure per day, per hundred square miles.

Further information may be had by applying to the Department of Lands and Forests.

ELZ-MIVILLE DECHENE

Deputy-Minister, Department of Lands and Forests



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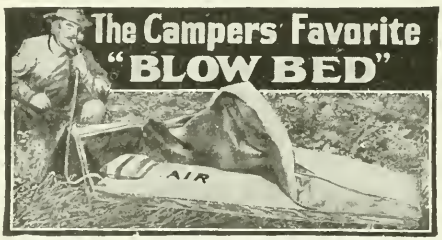


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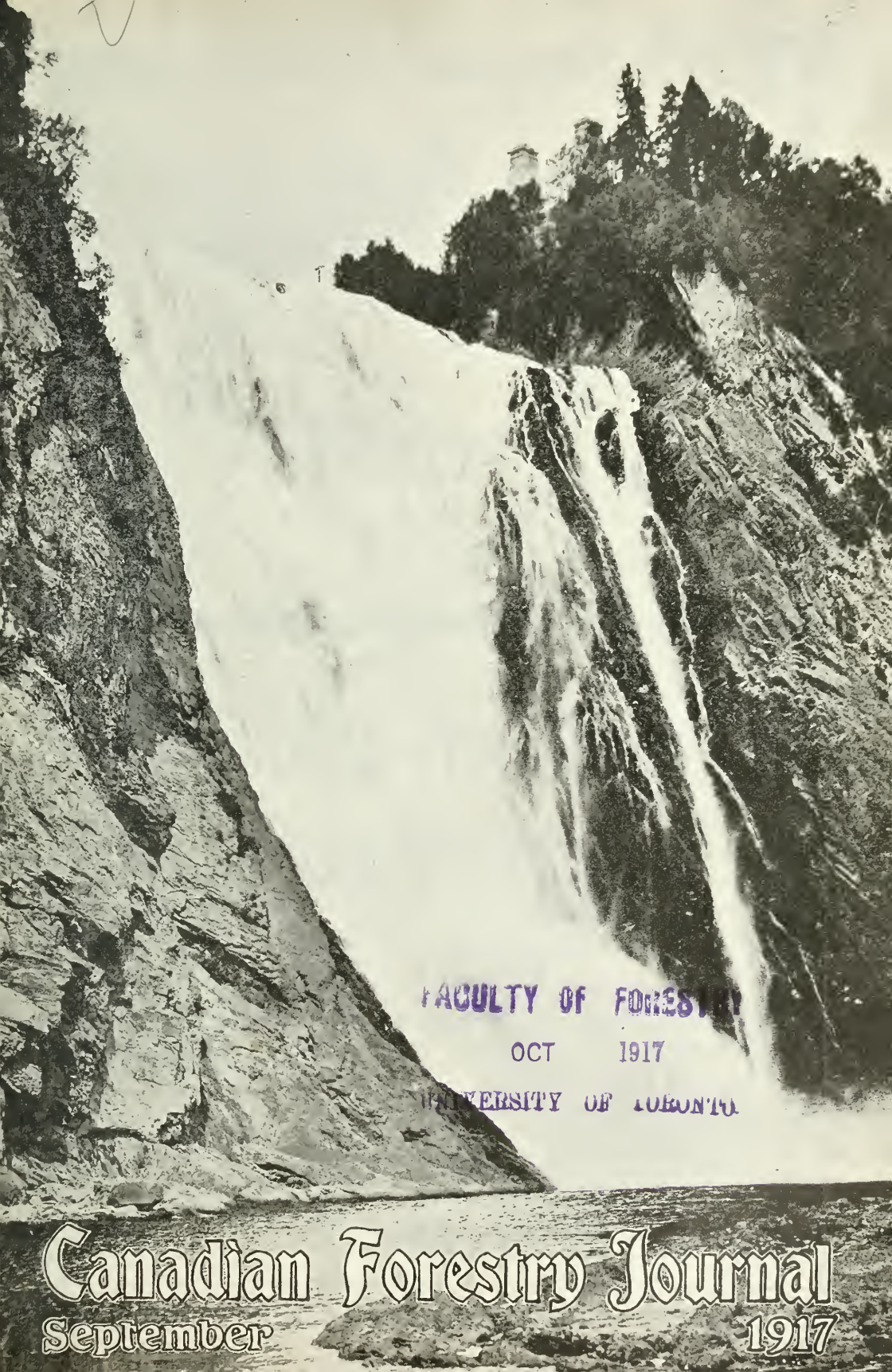

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# Canadian Forestry Journal

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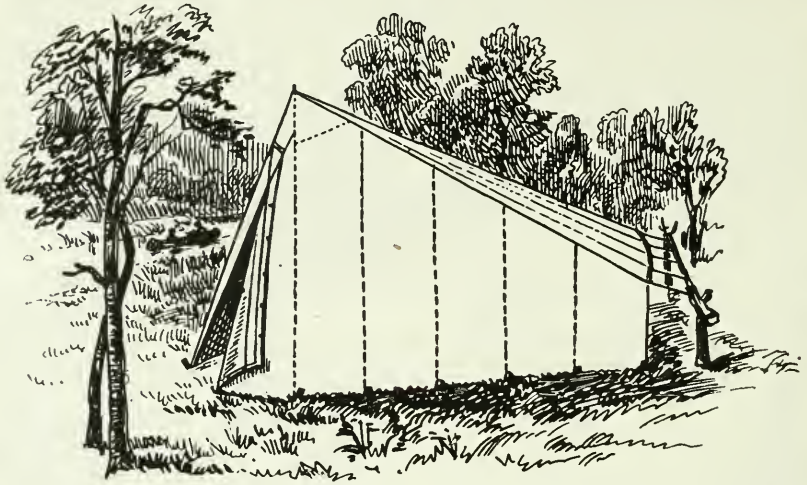

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**BOY FORESTERS MAKE WORK A HOLIDAY.**

**A busy scene in the forest bracken at Campsey Ash, Suffolk, where boys from Framingham College are shaping for the market many trees that fell in the gale of March, 1916.**

*Photo by A. M. Black, Nelson*

**The process of building a fire ranger's cabin at Duncan River, British Columbia.**

# Establishing a Plantation of Conifers on the Prairies

By A. Harding, Lougheed, Al'ta.

## What Trees to Plant and How to Plant Them—as Shown by Experience.

The planting of belts of trees on the prairie is becoming more extensive each year and the questions which are foremost in the minds of those who are undertaking the work are:

1st. What species of trees are best adapted for the soil and situation where it is intended to place the woodlot?

2nd. Where can they be obtained in the most economical and satisfactory way?

For most districts, the valuable native conifers, especially the white spruce, should be favoured above all the species of trees which can be grown on the plains and partially wooded areas of the west. They not only excel other trees in usefulness for the protection of buildings and stock but their drought-resisting nature and the comparative ease with which they can be grown place them foremost in the list.

Pines and spruce are rapid growers when once past the seedling stage and for a sustained growth and long life they must be placed in the shelter of other forest trees which are indigenous to the west.

Persons living within a moderate distance of a spruce or pine woods may obtain young trees for planting by carefully digging up the seedlings which are usually to be found at the edge of the forest or in openings which have been created by fires or logging operations. Preference must be given to those which are growing in the most exposed and sunny locations. The soil can be easily washed from the roots for convenience in packing and then the trees placed closely together in small bundles and their roots wrapped in wet moss for transportation. It is usually best to take trees from 6 to 12 inches in height, though slightly larger ones may be successfully handled.

### *The Planting Method*

The trees should be carefully planted in the garden or in other specially prepared soil, setting them slightly deeper in earth than they were originally and cultivating them for several years until a suitable size for permanent planting is reached.

People who are too great a distance from the woods to procure their own trees, can have some one who lives by the woods dig up the seedlings, taking great care never to allow the fibrous roots to become dry for an instant, then packing the roots closely in wet moss and placing in a box lined with burlap or other sacking and shipping to destination by express. This plan has been carried out with perfect satisfaction by the writer.

### *Preparation of Soil*

Preparation of the soil for the plantation ought to be started early in the year previous to setting out the trees in order to conserve moisture and otherwise obtain a suitable condition for the trees. The soil should be plowed to a depth of 9 to 10 inches so that the tree roots can readily penetrate to a sufficient depth to withstand drought and become firmly rooted in the earth.

### *Spruce and Pine*

Spruce and pine should be lifted with as much earth as is permissable for handling and spaced 4 by 5 feet or 5 by 5 feet apart in rows.

In districts which have a fairly heavy average rainfall and where it is difficult to give time to cultivation, satisfactory results will be obtained by placing a light covering of hay or straw around the tree for a distance of about one foot and giving no further attention to cultivation except to cut down weeds. The light mulch will prevent weeds from crowding the trees and keep the soil from checking and readily becoming dry close to their roots. Where the annual precipitation is scanty, shallow surface cultivation can be given for a few years until the trees are firmly established. Cultivation should not be continued after August 12th.

In an experiment with two plantations of mixed spruce and pine, one was planted and mulched as described above, while the other received cultivation for several years. The results at six years from the time of planting were somewhat in favour of the uncultivated one, which indicate that cultivation is not essential where an ample rainfall occurs.

The height growth of spruce when once well established is commonly from eighteen to twenty-five inches and the growth of pine considerably more.

Where it is intended to carry on the planting of conifers for a long period of years no better method of procuring stock can be found than by growing it from seed, but several years can be saved by getting the young tree to start the plantation with.

Pines should be transplanted at two years and spruce at three or four. Spruce which have been allowed to stand in thick clusters in the seed bed until they reach a height of two feet can be lifted in blocks and the soil soused in water until the roots come apart and then be planted with as good success as the smaller trees.

Instructions for the care of the seed bed can be obtained through publications treating of nursery work.

*Size of Trees for Planting*

A suitable size for planting is two to three feet. Trees of this height are more expensive to handle but they will escape injuries from grouse and other agencies to which smaller ones are more subject.

*Time of Planting*

Conifers are usually planted in the spring before growth starts, but where time cannot be taken for the work at that season of the year, equally good results may be had by planting from the 15th to the 25th of August, as the height growth is finished that date.

*Protection from Snows*

Where the plantation is exposed to drifting snow it is necessary to erect a snow screen at a distance of sixty to seventy-five feet from the plantation during the winter.

## WASTE AND THE SMALL JOBBER

"Noted improvement has taken place in recent years in logging waste, due to better market conditions and a growing market for inferior materials. This is not always the case, however, when logging is done by contract and one meets with considerable waste in high stumps, logs left lodged in the woods, oversized tops, etc. On some operations observed, this waste amounted to 5 to 10 per cent. of the stand.

"This could be prevented by a system of logging inspection and would not only pay for the inspection in increased stumpage but would be money saved for the operator. The fault is due largely to the fact that yearly contracts are made for logging, the logger trying to keep the cost per thousand at a minimum. The contractor's sole object is to make as much profit as he can (frequently little enough) and he will not take out difficult lodged trees or go to any particular trouble to cut low stumps unless checked up."

From Annual Report, Department of Lands, Fredericton, N.B.

## CHESTNUT BLIGHT

Chestnut blight has already done damage in Pennsylvania estimated at from $9,000 000 to $10 000,000. No tree attacked by it has been known to recover, although dozens of fake remedies have been brought out.

# Four-Thousand-Year-Old Sequoias

By Ernest G. Dudley

## Giants of California That Knew This World Ages Before Julius Caesar.

Thousands of tourists gaze at the "big trees" of the Sierra, with unseeing eyes, and then, content that they have seen all there is to see and know all there is to know, return home.

Alas,—if the Forester only knew as much as they!

The poet, as he watches the last dying glow of a California sunset enhance the already inconceivably rich coloring of an ancient Sequoia, murmurs to himself "deepening shadows," "forest dells," and "patriarchs of the forest." Artists vie with each other in their efforts to paint them and think of the colors,—reds, browns purples, and greens, and feel the soft elusive haze which their brushes cannot reproduce.

Scientists, with minds intent on prehistoric geologic history, topography, and the dynamic changes in earth's crust and climate which destroyed great forests of big trees, only to leave a few relics of past ages for man to wonder at, gaze with admiration on their beauty and vitality. All in their turn pay homage to the largest, oldest, and grandest tree that nature ever produced.

And the forester—perhaps a poet and a scientist at heart, works among them. Sunrises and sunsets he has seen of which the artist has only dreamed. He has heard the soft murmur of breezes mid their tops, high up in the clear blue California sky, and again the crash and roar of the storm king, which with inexorable fury, strives, as he has striven thousands of times before, to uproot and cast them to earth. He has marveled at their power of resistance, and with awe and wonderment, has seen one of them give up the fight on a calm and peaceful afternoon and crash to earth while trees merely nodded their heads as if in recognition of the passing of one of their lifelong associates. Thus the forester sees them, and seeing them thus, bends his energy the more to protecting and insuring their future.

### *The Relics of The Past*

To do this he studies their past and their present. Geologists tell him that ages and ages ago whole forests of Sequoias abounded on the Northern Hemisphere. Fossil remains in Greenland, Spitzbergen, and the United States prove this.

Before the glacial periods, and there were no doubt several such ice ages, great forests of luxuriant vegetation were in existence. To-day only the Sequoia and the Bald Cypress of the Southern States (Taxodium) remains of this almost extinct vegetation.

All the more interesting is the fact that the two Sequoias, the coast redwood and the big-tree are found only in California and within so limited a range.

We know that glacial action in California was restricted to the crests of the Sierras and that the ice bodies moved, but here and there, under some protecting ridge, a Sequoia, or perhaps only the seeds of Sequoia were left, and as the ice melted these formed the nuclei of the present groves. Then followed years of torrential rains which made canyons, valleys, and plains.

### 5,000 *Years' Growth*

**The forester is, of course, interested in the size and age of these trees. The General Sherman, a tree in the Giant Forest, is 28 feet in diameter and 280 feet high. It is no doubt between 4,000 and 5,000 years old, although ring counts on the stumps of trees felled in logging**

**operations have so far only yielded a tree of 3250 years old.**

Popular lecturers, in solemn tones, are apt to tell us, "Scientists agree that the bigtrees are 10,000 years old." This may or may not be the case. The foresters, however, after finding trees 3,200 years old, are willing to concede that there may be trees which took root between 4,000 and 5,000 years ago.

During logging operations in the Converse Basin of Fresno County, a clear boled symmetrical bigtree was being cut, and, much to the astonishment of the sawyers, black sawdust appeared at several different intervals. When the tree finally succumbed to their efforts, it was found that at different times fire had burned through the bark and charred the wood. But the tree with infinite patience had each time enclosed the wound with new growth and left the trunk perfect as far as outward appearance was concerned, except for one fire scar.

**The tree in question was 2,171 years old. It began its existence 271 B.C. At the beginning of the Christian Era it was already about twelve feet in circumference. When 516 years of age (A.D. 245) a burning occurred three feet wide on the trunk. It took 105 years to heal this wound. Then for 1196 years it grew without injury. When 1712 years old (A.D. 1441) two fire scars were made, the healing process taking 139 years. Again 217 years of growth followed without injury, until in 1797, when the tree was 2068 Years old, a great fire ate away the bark and attacked the wood in a scar 18 feet wide and nearly 30 feet in height.**

During the following 103 years before it was cut, four feet of this scar had been covered with fresh growth. If the tree had not been cut we might have expected it to entirely heal over about the year 2250. Thus it would have taken four and one-half centuries to repair the damage wrought by one forest fire.

Any other tree would have been attacked by decay and completely destroyed after any of these fires; but the Sequoia, with its thick protective bark, and its equally wonderful disease resisting wood, stands out among trees and man as having the greatest vitality of any growing thing.

*Why in Groves?*

We are absolutely certain that many individual trees are at least 3250 years old. Many may be between 4,000 and 5,000 years old. Why, then, do we find them still remaining in the small isolated groves where the ice age left them? Why, as in the case of the pines and firs, did they not reach out and take their place, scattered all over the great forests of the Sierras? They bear millions of seeds and wind and water scatter these about the forest. Yet century after century they have grown in the same spot. A few young trees grow up to take the place of those which die, but still in sight of the same little spot of earth where their parent tree, perhaps, is standing to-day.

## A TREE 4,000 YEARS OF AGE

When one of the big trees in California fell, John Muir counted 4,000 rings from the heart out. That meant the tree was forty centuries old. Thus it was a strong young tree when Abraham went into Egypt; it was bearing seed when Sodom and Gomorrah were destroyed; it was old as America when Joseph was sold into Egypt, nearly a thousand years old when David slew Goliath, and older when Christ was born than the Christian religion is to-day!

# The Waste of Hemlock Bark in B. C.

By J. H. Hamilton,

*Editor of "Industrial Progress," Vancouver.*

There is one subject which is worthy of much closer attention than has been devoted to it up to the present, the utilization of hemlock bark as a tanning material.

In 1916 the cut of hemlock in British Columbia amounted to one hundred and one million feet board measure. Taking fifteen hundred feet board to provide one cord of bark, this is equivalent to sixty-seven thousand cords of hemlock bark. The value of hemlock bark f.o.b. shipping point in eastern Canada and eastern States is about $14 to $16 per cord. Taking the conservative value of British Columbia hemlock bark at only $10.00 per cord, the 1916 cut represents a value of $670,-000.

B.C. hemlock bark should be worth more than Eastern Canadian bark, because it contains, on an average, 16 per cent. tannin against only 10 per cent. in the eastern bark.

### *The Hide Situation*

Turning to the raw hide question, there are approximately 25,000 cattle killed annually in British Columbia. The hides are shipped out of the country to the Western and Middle States and leather manufactured at those points is shipped into Canada. Consumers of shoe and harness leather in British Columbia have always had to import their sole and harness leather from foreign countries or bring it from Eastern Canada. Added to this, enquiries are coming to hand frequently from the Orient and from Pacific countries for sole leather. As an instance of the insistant demand, it may be stated that in September 1916, Japan purchased the entire available stocks of sole leather in the

Panoramic View of the farm of the Trappist Fathers at Oka, Quebec, showing some of the Lombardy Poplars bordering the highway.

Pacific Coast States and placed further heavy contracts absorbing practically the entire output for six months ahead. So far as the actual demand for sole leather in British Columbia is concerned, a conservative estimate places it at 250 "sides" daily, (a side being half a hide). This is equivalent to 120,000 "sides" per year. As above stated, British Columbia produces 25,000 hides (equal to 50,000 "sides") per year, so that the local market would more than absorb our local production of leather.

The above facts would seem to make a very good case for the establishment of a sole leather industry in British Columbia, the raw material being abundant and the consuming market steady.

### *Difficulties in the Way*

We now come to the influences which have prevented the establishment of a tan-bark and tanning industry up to the present time.

Up till a few years ago, western hemlock was in little demand as a building material, the name suggesting the inferior eastern species. The prejudice against hemlock was so strong that timber limits containing a large proportion of this timber were almost unsaleable owing to mills finding difficulty in marketing hemlock lumber. Practical education has changed this and to-day the prejudice of prairie consumers has been removed, western hemlock commanding a price commensurate with its true value. In addition to this, hemlock is being very largely used as a pulp wood and its use in this connection will undoubtedly increase very greatly within the next few years.

It may be asked why hemlock bark in British Columbia cannot be marketed and used in the same way as the inferior eastern hemlock bark, the more so since its tannin content is so much higher. The difficulty is purely an economic one. In Eastern Canada there is a steady demand for hemlock bark at prices which make the peeling and marketing of the bark quite an adjunct to the eastern timber industry. There the lumbermen send a section of their river-driving gangs back to the woods in early mid-summer to peel and pile tan-bark for drying, and before the fall rains it is hauled out of the woods on wagons. On the Pacific Coast this plan is not practicable, owing to the different logging methods in use and to some extent to the difficulty of haulage. Here most of the logging is done by donkey-engines and the log receives rough treatment in hauling over the ground to the loading deck, the comparatively soft hemlock bark becoming torn and pitted with stones and pebbles, which greatly lessen its market value. Efforts have been made by parties wishing to make experiments on a commercial scale, to secure regular supplies of hemlock bark from the loggers, but there appears to be a disinclination on their part to bother with the matter, as they did not feel assured a regular market will exist.

### *Experiments Needed*

This situation is obviously one which should be studied by our provincial forest department. Some way can be found for creating regular supplies of the bark and it appears to the writer that the best plan will be to demonstrate to the loggers that it will pay them to peel the logs and market the bark. The process of extracting tannin from the bark is a simple one and the cost of establishing an experimental plant for manufacturing dry tannin extract would be comparatively small. Once the government have assured themselves of the feasibility of the business, there is not the least doubt that capital would readily be forthcoming to establish the industry on a large commercial basis. If the manufacture of dry tannin extract were carried on in British Columbia the product could be shipped to any part of the world, as the freight on the concentrated material would enable it to compete with similar products in the world's markets. Such industry could without doubt be established in conjunction with the

large and growing pulp and paper industry in this province.

Western hemlock bark has been used as the exclusive tannin agent in at least one tannery in Washington for a number of years. This concern manufactures chiefly skirting leather for saddles. Its larger use has been prevented by the lack of tanneries, due to economic reasons, rather than unsuitableness. The prevailing cost of hemlock bark f.o.b. tannery has been $11.50 per cord.

Canada exported $77,997,000 worth of wood and manufactures of wood for the year ending March 31, 1917.

A mountain lookout station in the State of Maine, equipped with a snug cabin at its top and having telephone connection. These towers, which in other designs are becoming extensively employed in Canada are an essential of all good fire prevention systems.

## CONSEQUENCES OF A DROPPED MATCH

"Seldom has the city been subjected to more apprehension and excitement than that occasioned last Friday night when word came in that 26 men who were fighting the forest fire on the east side of Kalamalka Lake had been surrounded by the flames and were shut off from escape," says the Vernon, B. C. "News". All sorts of wild rumors were prevalent and relief parties were rushed out to the lake from all quarters, every available car in the city being called into requisition. The worry and uncertainty continued through the night, many of the men, most of whom were members of the B.C. Horse, having wives and families in town, whose suspense was almost unbearable, until the welcome news was received shortly after daybreak that all the men had succeeded in fighting their way through the girdle of flames, and had emerged safely.

*A Terrible Ordeal*

The men who were subjected to this fiery ordeal and who so narrowly escaped a terrible death are not likely soon to forget their experience of last Friday night. They had been fighting the fire all day under a broiling sun, with the thermometer over ninety in the shade, and the heavy gales of wind which came up in the afternoon and blew steadily all night, swept the flames through the timber at a terrific pace. Faint with hunger, heat and thirst the men at times were taxed to the uttermost to maintain their struggle to reach a point of safety, and at times some of them were so exhausted as to almost succumb to weariness and despair. Their escape was almost miraculous and furnishes one of the most thrilling chapters in the history of fire-fighting in this district. One of their pack horses was burnt to death but fortunately all the men escaped without any injury beyond the strain of exhaustion to which they were subjected.

*A Devastating Fire.*

The fire which now extends over 15 miles in length has been burning for nearly three weeks. At one time Mr. Melrose, the chief forester, along with Fire Rangers McCluskey and Mohr thought that they had the blaze well under control, but the high winds of last week gave it a fresh start. It is the worst forest fire that has raged here for the past twenty-five years.

## MINIMUM FINE FOR GUILTY PERSON

As a result of charges laid by G. C. Melrose, District Forester, L. Norris, S.M., conducted an inquiry into the origin of the forest fire on the east side of Kalamalka Lake, and four men were charged with having illegally set out the fire which caused the conflagration that raged through the timber for three weeks.

Joseph Montague, Henry Slater, Chas. E. Fraser and Lawrence Carswell were tried on this charge, the prosecution being conducted on behalf of the Forestry Department by W. H. D. Ladner. The accused were not represented by counsel.

*Magistrate's Dictum*

After hearing evidence in connection with the case on Thursday and Friday, the charges against Fraser and Slater were dropped by the prosecution. On Monday the Magistrate dismissed the case against Montague, but found Carswell guilty and inflicted upon him a fine of fifty dollars.

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From a manufacturer in Baden, Ont.: "I am very glad of having the opportunity of joining the Canadian Forestry Association as I think it is engaged in a splendid work. My thanks are due to you for the chance to assist even if only in a small way."

# *Fining Offenders for Causing Fires*

The record of two acquittals and eleven convictions out of thirteen forest fire suits is mentioned in a statement of the Chief Forest Fire Warden of Pennsylvania. Altogether forty-seven suits have been started for the setting of forest fires. In addition to the above acquittals and convictions, thirty-one cases are pending and three have been withdrawn.

Following the policy of making the punishment fit the crime by presenting bills for costs and damages caused by forest fires, no less than ninety-six cases have been settled out of court since April 1st through the payment of these bills by the guilty persons. Claims to the number of 415 have been presented for this spring's fires only, 226 of them to railroads. Settlements are still being made daily, and the chances are that almost one-half of the 400 cases will be settled without recourse to law.

# *French Woodlands Razed in Retreat*

The brutal vindictiveness of the retreating German forces on French soil, when nothing that remotely resembled "property" was left unspoiled, is described by the military correspondent of the Berlin "Lokal Anzeiger" in this manner:

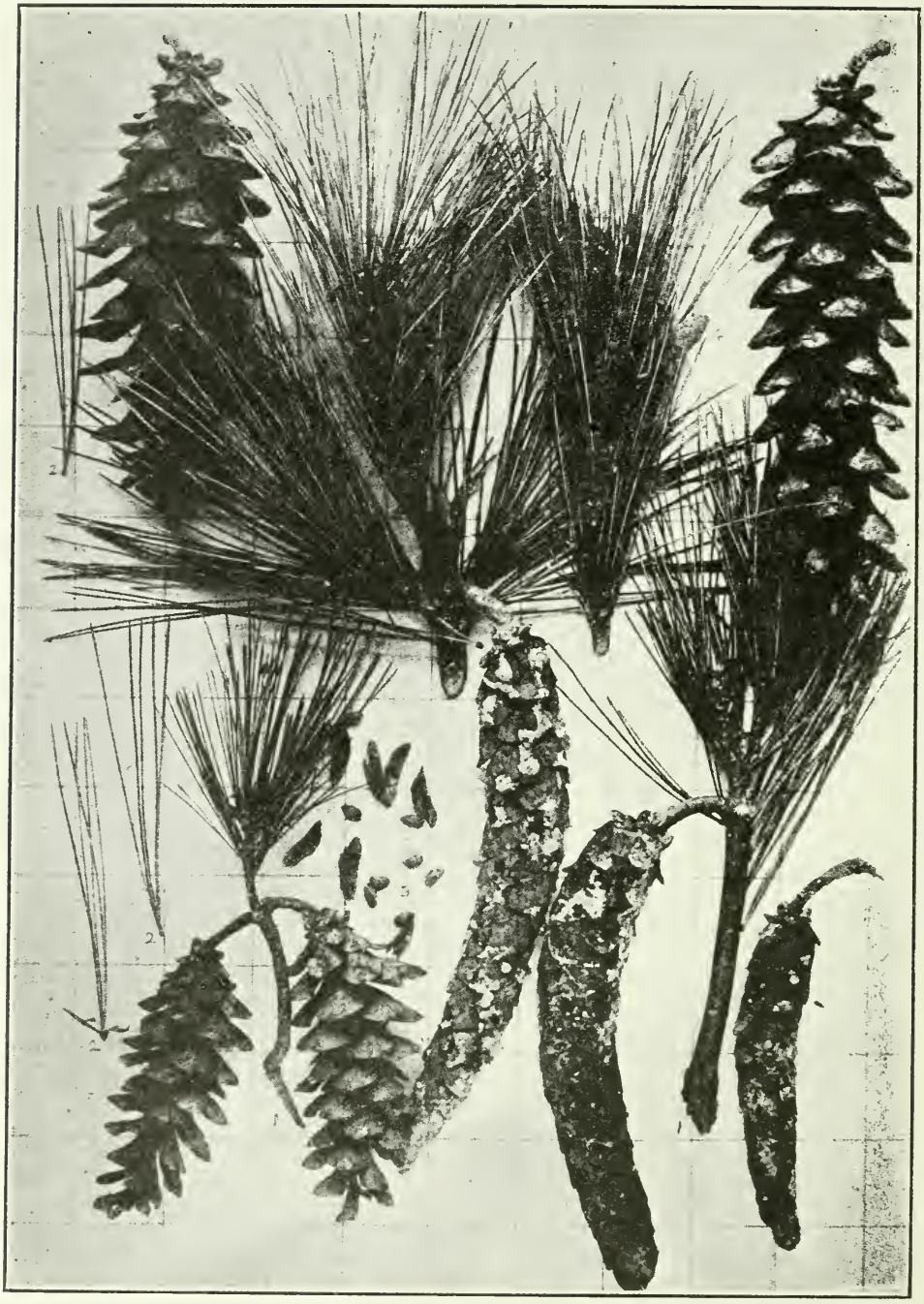
"In the course of these last months great stretches of French territory have been turned by us into a dead country. It varies in width from ten to twelve or fifteen kilometers (six and a quarter to seven and a half or eight miles), and extends along the whole of our new position, presenting a terrible barrier of desolation to any enemy hardy enough to advance against our new lines. No village or farm was left standing on this *glacis*, no road was left passable, no railway-track or embankment was left in being. Where once were woods there are gaunt rows of stumps; the wells have been blown up; wires, cables, and pipe-lines destroyed. In front of our new positions runs, like a gigantic ribbon, an empire of death."

The Berlin *Tageblatt* is also found gloating over this destruction of the dwellings and property of helpless peasants in this burst of fine writing.

"And the desert, a pitiful desert, leagues wide, bare of trees and undergrowth and houses They sawed and hacked; trees fell and bushes sank; it was days and days before they had cleared the ground. In this war-zone there was to be no shelter, no cover. The enemy's mouth must stay dry, his eyes turned in vain to the wells—they are buried in rubble. No four walls for him to settle down into—all leveled and burned out; the villages turned into dumps of rubbish; churches and church-towers laid out in ruins athwart the roads."

All this was done in the territory which the French armies had to cross before reaching their present position before St. Quentin. But to what avail?

It checked them not a bit. Across the desert waste they built highways and rebuilt roads. The wells were poisoned. The armies laid water-pipes for their supply. Every farmhouse and peasant's cot was reduced to dust. They carried their own shelter. The 'terrible barrier of death' was to them no barrier, only a reason why they must push forward with renewed strength and determination to hew down the vandals guilty of the barbarous destruction. Now in front of St. Quentin they see the *Boches* engaged in the same work preparatory to their next flight.



*Courtesy Romeyn B. Hough*

1. Branch of White Pine with mature cones bearing beads with pitch. 2. Detached clusters of leaves; 3. Seeds, some deta ched from their wings; 4. Young cones in Autumn of first year.

## — THE — White Pine

By Romeyn B. Hough

The White Pine is one of the tallest trees of the forests of North Eastern America sometimes attaining the height of 200 feet with a long columnar trunk 3-5 feet in diameter. When growing in the open it develops a wide pyramidal head easily distinguished from all other pines by its bluish green fine-needled foliage and the dark deeply-furrowed bark with which the large trunks are vested. It once constituted the bulk of large tracts of forest but being by far the most valuab'e timber tree of its range these tracts have been largely cleared away to meet the needs and wastes of a growing population, and now only occasional monarchs tower ng head and shoulders above the surrounding forests of other growth suggest the magnificence of the primeval Pine forests. Fortunately it is quick to reproduce itself and many tracts of land where cultivation has been neglected become quickly covered with its new second growth.

The wood of the White Pine is the most valuable of the pines for house finishing, window sash, blinds, etc. It is light, soft, very easily worked, durable and of a light pinkish-brown color with thin lighter sapwood. Reproduced by permission from Mr. Hough's "Handbook of Trees of Northern States and Canada." R. B. Hough, Lowville, N.Y.

# *The Bamboos of Japan*

To Canadian eyes the sight of an enormous trestle work of slender bamboo poles carrying a railroad track across a mountain chasm might not immediately inspire confidence. Such, however, is a common occurrence in Japan, where bamboo is used for a multitude of structural purposes.

Japan has more than sixty species of bamboo which have been named. The tree grows with amazing rapidity. For commercial purposes it is often used split but more commonly in the original round shape for the power of resistance in bamboo against pressure is remarkably great. Cutting occurs at from three to ten years, which illustrates the reproductive advantage of the bamboo as compared with Canadian spruce, for example, which for saw timber purposes cannot be utilized usually until above fifty years. Japan's supply of bamboo forests is constantly increasing as artificial afforestation is easy.

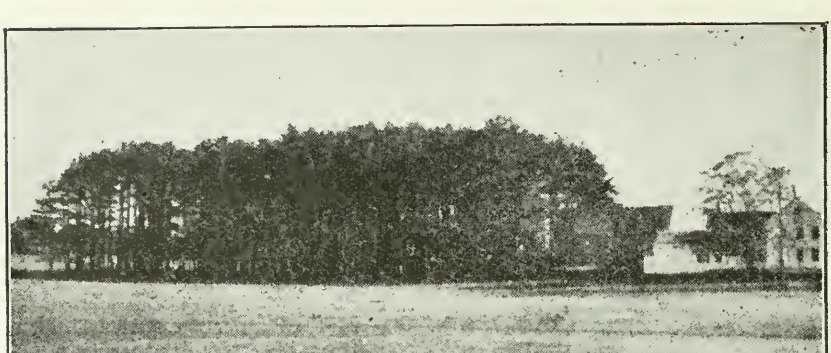
In the form of hoops for barrels and pails, the split bamboo is manufactured in great quantity.

Bleached bamboos are manufactured with a view to prevent unsightly change of color or to prevent splitting and other damage by extracting the oil while the bamboos are still in their original round shape. The process gives the bamboo an attractive lustre.

In the whole of Japan are over 600 species of forest woods. Twelve hundred and eighty men are employed on the state-owned forests for protection and improvement.

### DOES QUARTZ CAUSE FIRES?

A letter to the Forestry Journal last month from Mr. R. F Davy, Assistant Engineer, Department of Public Works, Temiskaming Station, P.Q., raised the question whether fires have been caused by the reflection of the sun's rays on white quartz on a hill side. The Journal has since heard from an experienced woodsman, now a fire inspector, that he endorses the theory and that several years ago he knew definitely of more than one forest fire that could have owed its origin to no other cause than the sun's rays acting on quartz.



# *What the Woodlot Means to the Farm*

By Roland D. Craig,

*Commission of Conservation.*

Woodlots on the farms can be made an important factor in the relief of the threatened fuel shortage. Farmers and the residents of smaller towns and villages situated within hauling distance of woodlots, should, as a measure of practical patriotism, use wood in preference to coal.

Few farmers realize the value of the crop which can be obtained from their woodlots. If even a small proportion of the attention given to other crops were devoted to the protection and improvement of the "bush" a good financial return could be secured. Aside from its value in affording protection against wind and storms, its importance in the conservation of soil moisture and its aesthetic value, the woodlot has a considerable value for the crops which can be harvested from it every year at a minimum expense. It should have a place on every farm.

Live stock should be excluded as they destroy the natural reproduction, injure the larger trees and pack the soil so that the growth of the trees is retarded. Defective and diseased trees should be removed first; then those of poor form, such as very crooked or very branchy ones whi.h interfere with the growth of better formed neighbours. The trees of the less valuable species such as dogwood, ironwood and hornbeam should then be removed. Every effort should be made to secure natural reproduction, but, if that be impossible, planting will be found profitable.

The tendency has been to encourage the growing of soft-woods suitable for lumber, such as pine, spruce and cedar, but the function of a farmer's woodlot is better fulfilled by producing hardwoods for fuel.

The fuel value of one cord of several of the common kinds of wood is equal to the following quantities of anthracite coal:

Hickory and hard maple 1,800 to 2,000 lbs. of coal; white oak, 1,540 to 1,715 lbs. of coal, red oak, black oak and beech, 1,300 to 1,450 lbs. of coal; poplar, chesnut and elm, 940 to 1,050 lbs. of coal; pine, 800 to 925 lbs. of coal.

Therefore, hardwood is worth, to the owner of the woodlot, from $6.00 to $9.00 per cord, as compared with coal at $10 per ton, plus the cost of hauling it out to his farm.

If a yield is to be sustained permanently, it should not exceed the annual growth which, in unmanaged woodlots, probably does not exceed ¾ cord per acre. This production can be considerably increased by careful management. A woodlot may be considered as similar to a savings' bank account from which the annual interest, represented by the growth, may be taken out or allowed to accumulate. In the case of the woodlot, however, the withdrawals can be so made as to greatly benefit the condition of the stand and improve its productivity.

The Dominion Forestry Branch and the various provincial forestry organizations have done much to encourage farm forestry by supplying advice and assistance. The Dominion Government distributes annually between 3,000,000 and 3,750,000 seedlings and cuttings among the farmers of the prairie provinces. In Ontario, the Forestry Branch of the Department of Lands, Forests and Mines also supplies seedlings for planting in farmers woodlots.

# *Natural Forest in Contrast to Woodlot*

By E. J. Zavitz,
*Chief Forester of Ontario.*

The forest has been spoken of as an organism and the forest tree finds its best development as one of a community. Proper soil conditions, influence of trees upon each other, etc., are all lacking in the common woodlot or in the case of the roadside tree. It should be understood that the woodlot and roadside tree grow under different conditions from the forest tree, the former lacking many factors which influence the latter.

To understand the abnormal state of roadside and woodlot trees it is advisable to study the conditions of the forest.

The forest may be discussed in relation to the forest floor and the trees themselves. The forest floor meaning the soil, humus, leaf litter and undergrowth.

The nature of the soil in the forest is greatly influenced by the protection and cover afforded by the trees and by the amount of humus it contains.

Humus is formed by the decomposition of foliage, twigs, and other organic elements falling to the ground. It makes heavy soil less stiff and sandy soils more binding. It aids in preparing food for the trees and possesses great capacity for absorbing water. Humus is very essential to the proper development of trees. The lack of it in the woodlot, owing to driving winds, makes a great difference between woodlot and forest. The litter of leaves, etc., has less opportunity of collecting and forming humus in the open woodlot.

In the natural forest, where normal conditions prevail, the undergrowth is composed of the more delicate plants which are not a menace to the reproduction of tree species. When an opening is created in the forest, soil conditions are such that tree seeds have an opportunity to germinate and grow before the opening is filled with grass and weeds, as is the case with the average woodlot. In the forest the tree seeds fall to the ground and are protected from sudden changes of temperature and moisture conditions by the leaf litter. Of course in many cases the leaf litter is a hindrance, as it prevents the seed from reaching the mineral soil. In the woodlot the seed may fall on the mineral soil, but the lack of protection prevents it from properly germinating.

After germination of the seed in the forest the young seedlings have protection which gives them a chance for a time. If an opening occurs by the falling of one or more trees these seedlings spring up to fill it. If the opening does not occur the seedling

may be shaded out and die.

The writer has passed through woodlots in May and early June where thousands of young seedlings had made a start. By the end of August these had all disappeared. What causes their disappearance? Not always stock grazing, but often drying out from lack of protection; this lack of protection being usually due to the want of leaf litter and humus as well as to the open condition of the woods.

It is difficult to say of what value a denuded soil is in relation to tree growth. On some sand formations in Ontario there stood in the original forest some splendid trees. After clearing the land, a few good crops were secured, but soon the sandy soil became weakened as it lost its covering of humus. To-day some of these lands are waste sand dunes.

Trees in the forest with tall, clean stems have passed through many stages. We are apt to think that they always grew with many companions and passed from the seedling stage into the thicket or pole stage. Frequently some were crowded out to die. The tall forest tree we see to-day is the survivor of a long struggle and its roots may be taking up ground which in its youth produced a few hundred saplings.

The thicket or pole stage served its purpose. If the tall forest tree had been growing in the open it would have large branches a few feet from the ground and would never have reached the great height to which it has attained. To survive in the struggle, the tree in the thicket has to spend most of its energy in height growth during its early life, in which time the side branches are shaded out and die while very small. This cleaning of branches gives a clean stem on which a growth free from knots may be developed in the years to come.

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# *Unique Forestry Exhibit at Prince Albert*

The Dominion Forestry Branch Exhibit at the Agricultural Fair in Prince Albert, Sask., on August 9th, 10th and 11th, attracted much favorable comment by both the public and the press. The miniature forest arrangement was most unique representing a regulated forest area cxntaining various age classes. The species used were white and black spruce and jack pine. The oldest age classes were made up of trees twenty-five to thirty feet in height, some being trimmed up from the ground for six or eight feet thus providing a shady nook for tired visitors. Park benches were scattered around among the trees and were freely used by women and children. The trees from twenty feet down were not trimmed but left with their branches extending to the ground. Numerous of the trees had an abundant supply of cones—thus showing the seed crop.

A small area of nursery stock was shown in front of the forest as well as representative areas of burned forest, poor cutting area with high stumps, waste and no brush disposal. In contrast another area was shown alongside showing good cutting with low stumps miniature cordwood piles, some neat brush piles and some which had been burned. In this area was also shown the uninjured young growth coming up. A model ranger house presented by the MacDiarmid Lumber Co. of Prince Albert was placed among the smaller trees. Forest Reserve boundary notices and the numerous metal and cloth fire and Reserve notices were posted in conspicuous places.

Adjoining the forest a small ranger's camp was pitched with tent and camp fire and examples of how to extinguish camp fires with water and earth. A canoe used by fire

rangers in the north was shown with complete fire fighting equipment and outfit used by them. A large black bear loaned by the soldiers at the Armory was chained at the edge of the forest and attracted much attention by his antics.

At the rear of the forest with a path leading up to it a further exhibit was arranged in one of the buildings. This building was decorated with elk, deer and game heads, bunting and flags as well as numerous mounted birds and a large white-fish loaned by Mr. Geo. McDonald, Fisheries Inspector.

On the walls were arranged maps and mounted photographs showing the reserve activities and views of merchantable and young stands, planting and logging operations, brush piling and burning, forest fires and their results, effects of drifting sands, Forest Reserve improvements, grazing and uses. Outfits used by both forest and fire rangers for fighting fire were displayed from grub hoes to water alforjas. On two long tables were arranged for free distribution literature, bulletins, reports, blotters, rulers, pocket whetstones and other publicity material.

Two stalls were occupied by equipment and pictures showing railway fire protection. A small hand jigger used by railway patrolmen and a gasolene car used by inspectors were shown with their equipment. Samples of Saskatchewan Forest Products and a model house of White Spruce were loaned by the Prince Albert Lumber Co.

The exhibit was arranged under the direction of Mr. G. A. Gutches, District Inspector of Forest Reserves for Saskatchewan and with the assistance of Chief Fire Ranger S. W. Thompson, Divisional Fire Inspector T. MacNaughton and Ranger In Charge A. Williscraft.

## THE CRIME OF A MATCH!

"The greatest crime that can be committed through the agency of a match is the lighting of a destructive forest fire. Consider the case of a building destroyed by fire. Money will replace it. In a year or two we may see another building rise on the same site, easily a better building than the one consumed. Then consider the destruction of a forest by fire. A flaming match, or a lighted cigar or cigarette stub, carelessly tossed among the dry leaves starts the conflagration, which sweeps up a hillside, leaving a bare and blackened ruin hundreds of acres in extent. *Money cannot replace! it* Time may restore this forest to some measure of its former grandeur and value, but scarcely in the life time of a man. Consider this burned area ten years after—or even twenty years—a mass of brush and brambles, with the gaunt and weathered trunks of many fire-killed monarchs still standing in disfiguring array."—*Kennebec Valley Forest Protective Association.*

## FRANCE'S REGARD FOR HER FORESTS

"It is evident that France cannot supply her own requirements in wood. The policy adopted throughout France for the conservation of her forests, to cultivate them and to cut only as much as can be produced each year, necessitates the purchase elsewhere of the wood she needs for building purposes, etc. A change in this policy would bring about a revolution in France, where whole districts (communes) pay their taxes from the annual revenue from their forests, and in some cases even distribute a considerable surplus among the inhabitants."—*From report of Dominions Royal Commission.*

# THE USES OF WOOD PULP

By John S. Bates
*Superintendent Forest Products Laboratories, Montreal.*

**Paper making is only one of hundred purposes to which pulp is put.**

The pulp and paper industry has expanded very rapidly in Canada during the past ten years and it appears that Canada is destined to become perhaps the leading country in the world in the manufacture of pulp and paper products from wood. This is largely because of our extensive natural resources of water-powers and suitable tree species. It is important to point out the opportunities and responsibilities for Canadian engineers in this technical industry. The consumption of paper increases so rapidly from year to year in the more highly developed countries that there is no indication of slackening development, at least for some years to come. Canada now has a total of about 90 mills many of which are large and of modern design. The export figures for the calendar year 1916 show that pulpwood, wood pulp and paper have increased to nearly half of the total export value (approximately $100,000,000) of all forest products with the exception of the small proportion of specially manufactured articles.

*Woods for Pulp*

The soft woods are the most important species for paper-making, spruce and balsam fir accounting for the bulk of the woods used with hemlock, jack pine, tamarack and other conifers coming into more extensive use. Poplar and basswood representing the "soft hardwoods" are valuable for making soda pulp and a variety of hardwoods such as birch and maple are used in smaller quantity. In 1915 the total reported pulpwood consumption amounted to 1,405,836 cords with an average value of $6.71 per cord. In addition Canada exported 949,714 cords of pulpwood, which quantity has remained fairly constant for several years while the consumption of pulpwood in Canada has rapidly increased.

*Uses for Groundwood Pulp*

The groundwood process is the simplest method of manufacture, involving the wet grinding of pulpwood blocks. In 1915 this process accounted for 52.9 per cent of the total pulpwood consumption. An important direct use of groundwood pulp is in the manufacture of wallboard such as ordinary "Beaver Board" and the thicker "Insulite" board used for insulating cold storage rooms and refrigerator cars. Fibreware, represented by indurated pails and tubs, moulded egg cases and pressed milk bottles impregnated with paraffin, is composed mainly of groundwood pulp. Paper pie plates are cut and pressed from sheets of this pulp.

The sulphite process is the most important of the chemical processes and in 1915 used 33.5 per cent of the total pulpwood. The wood is chipped and steamed in large digesters with a solution of calcium (and magnesium) bisulphite containing free sulphurous acid, which dissolves most of the lignin and other non-cellulose material amounting to about one-half of the dry weight of the wood. Production of sulphite pulp has now reached about 1,000 tons per day, over half of which is used in the manufacture of paper in Canada. An important development is the increase in manufacture of bleached sulphite pulp for high-grade papers.

*Making News-Print*

News-print paper is by far the most important manufactured product in the pulp and paper industry and is essentially a mixture of about 75 parts of groundwood pulp and 25

parts of sulphite pulp with suitable loading, sizing and coloring materials. Canadian production now totals about 2100 tons per day which is now over half the production of the United States. Only a small proportion is needed for Canadian newspapers so that about 89 per cent is available for export chiefly to the United States. Other products made by mixing groundwood and sulphite pulps are hanging paper (wall paper), the cheaper grades of wrapping paper and book paper, container board for paper boxes, liners for cars and boxes, paper for posters, etc.

*Hard Rubber Substitute*

Sulphite pulp in the unbleached or bleached state is used for making many papers of the higher grades including print paper, book and writing tissues and wax paper. Recent attention has been given to production of imitation parchment and greaseproof papers such as glassine. Sulphite pulp is well suited to the moulding of plastics such as toys and novelties by incorporating binders. Vulcanized fibre or hard rubber substitute is usually made by treating pulp with zinc chloride and mixing with red ferric oxide, with the addition of glycerine if a pliable product is desired. Some of the paper wheels and pulleys come under this head. A sample of surgical cotton substitute from Europe turned out to be an excellent product from bleached sulphite pulp and it is reported that large quantities are being used by Germany during the present cotton shortage. Viscose is one of the artificial silk materials which can be readily made from wood pulp. Bleached sulphite pulp is first converted to alkali cellulose by treating with strong caustic soda and then to soluble cellulose zanthate by the addition of carbon disulphide. After pressing into threads through dies or moulding into heavier articles the material is readily converted back to stable cellulose in the form of artificial silk, films or moulded articles. It is also used for sizing textiles and paper. There are several plants in the United States and undoubtedly the industry will be established in Canada. The best gun cotton is made from purified cotton, but good grades have been made from bleached sulphite pulp in England and at the present time to a large extent in Germany. Cellulose acetate is ordinarily made from cotton and it is doubtful if bleached sulphite pulp will be used in America until the process can be improved. The non-inflammable and water-proofing qualities of cellulose acetate made it more valuable than nitro-cellulose for aeroplane varnish, films, artificial silk and celluloid substitutes. In

PICKING OUT A "JAM" ON THE KENNEBEC RIVER, MAINE.

some industries a filter mass of sulphite pulp has been successfully used in place of cotton fibre.

*Waste Liquors*

Waste sulphite liquor is one of the most frequently quoted industrial wastes, as millions of gallons are turned into the rivers every day carrying half of the original pulpwood substance together with most of the lime and sulphur used. Recovery of by-products is difficult and costly but it is safe to say that Canada will begin to practice recovery in the near future. In Europe and the United States evaporated liquor is used quite extensively as a binder for briquetting fuel and as core binder in foundry work. The tannin-like substances are separated and incorporated with true tannins in preparing sole leather. Sweden has taken the lead in recovery of ethyl (grain) alcohol and produced in 1916 over one-half million Imperial gallons of 95 per cent alcohol for industrial purposes, motor fuel and potable spirits. It is reported that Germany has established this process in fourteen sulphite plants in order to conserve potatoes which are the usual source of alcohol in that country. Waste sulphite liquor contains about 1.5 per cent of fermentable sugars which are produced from the wood during the cooking process and these sugars are fermented to alcohol by yeast. The direct recovery of sugars and other organic matter makes available a fairly good cattle food. Recent processes aim at the precipitation of the lignin content for use as fuel and a number of new plants are going up in Norway. Minor processes are the recovery of destructive distillation products, fertilizer and mordants for dyeing. There is also the possibility of recovering sulphur compounds which however do not originate in the wood.

*Twine From Paper*

The sulphate process used 13.1 per cent of the Canadian pulpwood consumption in 1915. This process is a development of recent years and produces a remarkably strong flexible fibre by the combined action of caustic soda and sodium sulphide on the softwood chips. The value of kraft pulp is most noticeable in the brown, strong, thin wrapping papers which are now so widely used. A variety of ingenious uses for this pulp have been worked out in Europe and elsewhere. Paper twine is made by cutting kraft paper into narrow strips and spinning into a coarse strand now largely used for wrapping parcels and for binder twine. The threads may be assembled to produce first-class rope. By weaving there is obtained bagging material to replace burlap, carpets and matting, coarse cloth for upholstering furniture or even for wearing apparel, and also belting which is now used in Europe. By wrapping layers of kraft paper on a core and impregnating with tar binder conduits are made which can be turned and threaded; these are especially useful for underground electrical conduits and acid-resisting water pipes. Kraft pulp is also used for making imitation leather for suitcases, as well as counters and heels for boots and shoes.

In Europe the sulphate process is sometimes modified to give more fully cooked sulphate pulp which can be bleached and used for higher-grade papers such as book and writing.

*Oils From Waste*

The spent liquor is always evaporated, incinerated and causticized for the recovery of alkalise which are used again for cooking. One Canadian mill is now recovering so-called "resin oil" which separates from the spent liquor. Turpentine and small quantities of other light oils may be recovered from resinous woods by distilling with steam during the cooking operation and resin soap separates from the spent liquor on cooling. This applies particularly to manufacture of kraft pulp from longleaf pine in the Southern States. Methods have been proposed for the production of methyl alcohol, acetone, acetic acid, higher oils by the destructive distillation of the evaporated liquor with simultaneous recovery of alkali and perhaps oxalic acid from the residue.

# The Summons

By L. H. Bailey

*Have you flung your arms and shouted*
*till the forests answered back,*
*Seen the footprints of the cougar or the*
*black bear's shambling track?*
*Have you ridden mountain horses as*
*they follow up the trails,*
*Seen the court'sying water-ouzel and*
*the scuddling of the quails?*

*Then you come with me to Shasta*
*Where the racing waters flow,*
*Far behind the dome of Shasta,*
*Where no tourists ever go,*
*In the forests deep at Shasta*
*Where the mighty fir-trees grow.*

*Have you smelt the pitch-knots burning*
*as they snapple in the breeze,*
*Have you seen the camp smoke rising till*
*it billows in the trees?*
*Have you stretched full length and*
*slumbered on the needles for a bed,*
*With the sun-flecks dancing on you*
*through the tree-tops overhead?*

*Then we'll go to find the rivers*
*Where they open to the sky,*
*Wade the oozy turbid rivers*
*Where the water-bushes lie,*
*Feel the salmon in the rivers*
*As it rises to the fly.*

*Have you heard the boiling waters when*
*they bubble through the night,*
*Felt the touch of roaming night-winds*
*as they wander from the light?*
*Have you breathed the wind of fir-trees*
*in the silence of the wood*
*With the night-damps closing round*
*you where no human ever stood?*

*Then you join me in the darkness*
*Where the night is dense and deep,*
*Stretching silent in the darkness*
*When the wild beasts lie asleep,*
*Hear a startle in the darkness*
*Where a panther makes a leap.*

*Have you heard the rain drops tinkle*
*as they strike upon the leaves,*
*Have you felt the fore-winds freshen*
*when they whiffle in your sleeves?*
*Have you sat beside the river when the*
*rain begins to pour,*
*Do you know the fragrant music that*
*makes along the shore?*

*Then we'll hasten to the weather*
*Be it rain or sun or cloud,*
*To the hazy purple weather*
*And the dust-deeps that enshroud,*
*To the free and open weather,*
*When the winds are wild and loud.*

*Have you torn thro' thorny thickets,*
*walked a ten-mile at a stage,*
*Floated down the falling rivers, past*
*the sedge and saxifrage?*
*Have you waited at the deer-licks*
*for the coming of the game?*
*Have you bivouacked in the forest till*
*you've clean forgot your name?*

*Then we'll off into the forests*
*Where the bubbling waters run,*
*Shout our challenge in the forests*
*At the rising of the sun,*
*Build our night-fires in the forests*
*When the careless day is done.*
*—From "California Forestry."*

## PULP FROM PAPYRUS

It is reported from Christiania that a company is being formed locally to utilize papyrus in the manufacture of paper pulp.

The name of the company is the Walmer Papyrus Pulp Co., Ltd., with a capital of 150,000 pounds.

Papyrus growing in North Zululand will be utilized, and it is stated that a concession has been obtained permitting exploitation for a term of 20 years.

## USING JACK PINE

A good example of the conservation tendency in wood using industries is shown by a Canadian wall board company which previously used a spruce centre for its product and recently changed to jack pine with what are said to be excellent results.

# *Sheep and Goats As Tree Destroyers*

Some Canadian planters of forest tree stock have had experiences with depredations of goats, both amusing and tragic. There is under way in the United States at the present time a discussion between the breeders of sheep and goats with regard to their availability as an agency to convert brush-land into grass land. The "Angora Journal" has the following to say:

"Sheep are a grass-feeding stock; they will not eat brush unless forced to do so by absence of other pasturage. They will browse on scant pasture, leaving the hazel, willow, or other bushes to grow unmolested if any grass is to be had. On the other hand, goats will leave grass to sheep and cattle if any green tree or shrub growth is available. They prefer it. Sheep never stand upright on the hind legs to browse; goats will browse off the foliage and tender bark to a height of six feet and even higher. Forest officials have adopted goats as a means of keeping fire-breaks clear of underbrush. Goats are used to do the pioneering ahead of other live stock on new lands in many Western States.

"The prejudice against goats is questionable. It has been created by the inhabitant of the vacant city-lot—a neglected creature that was forced to get subsistence by any means it could. It gnawed the labels from tin cans to get the taste of the paste beneath—and acquired a reputation for eating tin cans. The goat of the open fields and prosperous farms is as different from the vacant-lot or common type as is the Hereford thoroughbred from the raw-boned cow of the city suburbs. The goat is the cleanest feeder of the live-stock world. It will not eat straw or hay that has been under foot. It nibbles the choicest bits of foliage and rejects all uncleanness.

## ONTARIO!

Ontario's timber production last year valued at $26,774,937 or 40 per cent. of Canada's total output.

Pine production, 905,442,000 ft. B.M.
Pulpwood, 246,282 cords.
Railway Ties, 5,704,459.

Ontario's woodworking industries, using 34 different kinds of wood, provide a ready market for the lumberman. Eighty-two per cent. of lumber used in Ontario's industries is purchased within the Province.

## COUNT OVER SURVIVORS

Mr. William Kilby, formerly of the Canadian Northern fire protection service at Winnipeg, is now with the Royal Flying Corps in France, has already been sent up as an observer and will qualify for his commission in a month or two. Writing to a friend, Mr. Kilby remarks: "We'll have to have a general powwow of foresters and kindred souls after the war to kind of count over the survivors"

## SAND BAGS OF PAPER

Mr. H. R. Christie, formerly of the British Columbia Forest Service has sent to an Ottawa friend a sample of the German sand bags made entirely of paper fibres. In appearance the article somewhat resembles a coarse brown linen bag but is smoother in finish, each strand being tightly rolled and woven with great exactness. Mr. Christie states that the bags are very serviceable except when exposed to moisture, when they rot. The Germans, he reports, do not use nearly as many sand bags as the British and French, for the reason that they have more timber at their disposal and make prolific use of it.

# Restoring Beauty to a Rocky Island

'The whole northern country was once well forested, bearing the only crop it was fit for growing; we have lumbered it out of existence without care to save maturing growth and thus retain continuity of forest stand and new crop," writes the Editor of the Peterboro Examiner. "Fifty or more years ago many of the islands of Stony Lake were well wooded. About half a century ago a forest fire swept them and left bare rocks. Nature has, in some parts, partially repaired the waste, and man might have done much that he has not done to reclothe the stony nakedness with the verdure of trees.

"That this is feasible is shown by the action and experience of Mr. J. B. McWilliams, as to his island on Stony Lake, near Burleigh. When, a few years ago, he built a cottage there, his island was, to use his own words, "almost all bare rock, and now I have about twenty-five different kinds of trees growing, besides numerous shrubs, all on less than two acres of area." Here is at once practical proof and precept. It shows what can be done when care and recognition of the value, and love of tree growth are allowed to become agencies in repair of waste and in forest restoration.

"On this island we have the beautiful and continuously growing evidence of what can be done on most of the islands of the Kawartha Lakes group, inexpressibly enhancing their present beauty, and in all the arid and treeless region of the north country, that with proper government or county action might be clothed with a profitable growth of forest that would be a merchantable asset and source of revenue for future generations."

## DOLLAR COMPANY LOSES

A serious bush fire broke out in the Dollar Company's holdings back of Union Bay, British Columbia, in August. Upwards of 500 acres were burned over before the fire was subdued. The Dollar Company had only purchased the property a few weeks ago, had 65 men working, and lost about $20,000 worth of logs, piles and poles. They saved all their machinery, however.

## A FEW DON'TS FOR HUNTERS

*Don't* pass a loaded gun for inspection to a brother hunter, or anyone else for that matter.

*Don't* leave a loaded gun around the house or camp or anywhere else.

*Don't*—whether it is loaded or not —lay hold of a gun by the muzzle and pull it toward you, from a canoe or a wagon.

*Don't* climb over a fence with a loaded gun in your hands.

*Don't* think you can do accurate shooting with a dirty gun.

*Don't* "walk up" on any wounded game without having a cartridge in the chamber of your rifle, ready for any surprise.

*Don't* by any chance set the woods afire.

## WEIGHTS OF TIMBER

Weight of one cord of green spruce pulpwood is about 4,500 pounds.

Weight of one cord of dry spruce pulpwood is about 3,000 pounds.

Weight of one cord of green white-birch is about 6,000 pounds.

Weight of one cord of poplar pulpwood is about 3,200 pounds.

Weight of 1,000 feet of old growth spruce logs, (according to Maine or Holland rule scale) is about 6,000 pounds.

The weight of green lumber may be reduced from 30 to 50 per cent. or more in seasoning, while the strength of small clear pieces may increase in seasoning up to double the strength when green.

# *What Slash Disposal Means*

**After a logging operation the fire risk is increased from 100 to 200 per cent. This risk decreases every year, and from 6 to 10 years becomes normal again, rarely extending to 15 years.**

**Director of Forest Survey, New Brunswick.**

The slash disposal question is one that should receive the serious consideration of both the loggers and the Department officials. Slash disposal has passed the experimental stage and is being endorsed not only by forest administrators but by the loggers themselves in many localities. The cost for disposal varies from 25 to 40 cents per M., as practiced in Quebec, in similar stands, by lopping. Similar results have been secured in northern Saskatchewan.

In Minnesota slash is piled and burned generally as logging proceeds, and the results are shown from the following section from report of State Forester Cox, 1914:

"All kinds of slash do not burn the same, nor does any one kind burn the same under different conditions. Green slash of pure cedar and spruce, for instance, is hard to burn, but, if a fire is started and the green slash piled on, it burns well. Pine slash burns well either in winter or summer. Where the timber is dense and the slash considerable, the expense of burning at the time of logging is very nearly balanced or may even be more than offset by the increased convenience in skidding. Actual operations have shown that where timber is heavy (150 M. per "40" or greater), slash will be so dense that considerable piling will be necessary before skidding can be done, and under these circumstances it would be much cheaper to burn at the time of cutting than to wait until spring. Figures from further operations also show that 25 cents is a fair average cost for burning of slash at time of logging, to say nothing of the increased benefit to skidding and to the operation as a whole.

"In summarizing conditions generally, the policy has been adopted to enforce winter burning, or very early spring wherever winter burning would entail unreasonable expense."

His general regulations for spruce and balsam stands are:

"1. Upland Type.

Where spruce alone is cut and the stand is mixed with pine or hardwood, burn the slash as logging proceeds.

2. Swamp Type.

Where 40 to 50 per cent of the number of trees remain standing, fire line a strip at least 150 feet wide around entire slashing by burning slash in winter or early spring. If clean cut, pile slash in windrows and burn in early spring.

3. Any Spruce or Balsam.

Where most of spruce or balsam is cut out, but there is considerable timber remaining that may be valuable in the future, pile slash in windrows as logging proceeds and burn in early spring."

The question is of considerable importance, and one which steps should be taken to reduce to a minimum, either by lopping, piling and burning, or by intensive patrol during the danger period.

(From Report of Department of Lands, Fredericton, N. B.)

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## MILLION YEAR-OLD TREE

A wood specimen found in glacial drift and estimated by the Wisconsin state geologist to be approximately a million years old has been identified by the forest products laboratory of the Forest Service as spruce.

Avoidable Waste in the Forest.

A lodged tree in a New Brunswick operation left to rot.

A $30,000 corporation has been formed by twenty-eight prominent business men of Dallas, Texas, according to the News of that city, to manufacture paper from cotton stalks. It is planned to increase the capitalization of the company, which had been chartered, and erect a one-quarter million dollar mill for the process. Samples of paper from cotton stalks have been made and the method it is announced, has been proven satisfactory.

## TEA BY THE OPEN FIRE

From the faucets of the fountain,
And the bottles of the bar,
I've tried many fancy gargles,
Most as many as there are,
But the drink that's first and foremost,
If you put it up to me,
Is the scalding can of ashes,
Swamp juice, soot—and tea.

*From "OUTING".*

# Estimating Fire Damage

An effort to secure uniform statistics regarding forest fires and the damage caused by them was made recently by a special committee of the Canadian Forestry Association. The committee secured many valuable suggestions and criticisms which will be utilized in a report. Dealing with this subject, Mr. Ellwood Wilson, Forester of the Laurentide Company, writes:

"The necessity for uniform statistics of forest fires and the damage caused by them is a subject of great importance and likewise of considerable difficulty. It would seem to be necessary to have, whenever a fire occurs, the date, location, cause, area burned over, stand before the fire occurred, timber which can be salvaged, and timber burned. Value of timber or other resource destroyed is also important. The last three items are very difficult to ascertain. Protective agencies cannot be expected in the nature of the case to cruise and accurately determine the amount of timber on areas under their care. The ordinary fire ranger is certainly not qualified nor has he the time to make a careful estimate of the amount of timber which can be salvaged, nor the value of the trees destroyed. At best the most he can say is: green timber destroyed, or old burn, or logging slash or some such general description, and he can say timber scorched but fit to cut, timber all burnt, etc., and none of these designations are of any real value for statistical purposes. In fact, the determination of areas is really often beyond the capacity of the ranger, and again the difficulty of leaving his patrol to measure burnt areas crops up. Then when the question of valuing such damaged areas is encountered, further difficulties enter. Only an expert in local values is competent to say what timber is worth. The question of the value of young growth, of scorched timber and of areas which have just started to reproduce is a trying one, and no two owners will agree as to the value placed on such areas. Much preliminary work is necessary, especially in a country which has not even been carefully mapped, such as all of the Canadian co-operative associations are operating in. It might be possible for these Associations to undertake such mapping and estimating work. This would give winter work for rangers and inspectors, a very important matter indeed."

## A RECORD LOG JAM

Probably the record log jam of the world is blocking the Glommen River in Sweden.

A quantity, estimated at about 450,000 dozens of logs, have piled up at Bingfoss lock, almost inextricably, to an enormous height, and it is only possible to extricate the logs one by one with immense work and difficulty. Instead of employing as usual about 20 to 30 men, the association has now 130 men engaged, who work day and night totry to loosen this mighty mass of timber. Although everything has been done to stop more timber from coming down to Bingfoss, the river still carries a great deal of timber, and the quantity at Bingfoss is thus steadily increasing. As the situation now is, it is hardly possible to clear the quantity of timber at the Bingen lock in a shorter time than two years, and there is no prospect of being able to release this year much more than one-half of the quantity of timber which has been marked this season for being floated in the Glommen River.

## CHEAP MEAL IN PLANTER'S CAMP

Roast veal, fried potatoes, stewed tomatoes, dried corn, canned peaches, hot biscuits, butter, cookies, coffee,—not a menu of a fashionable hotel, but of a meal served in a Pennsylvania State Forest tree-planting camp. It cost 16½ cents per man.

# Timber Resources of Northern Manitoba

By J. A. Campbell,
COMMISSIONER OF NORTHERN MANITOBA.

## In Spite of Fire Damage Much Timber Exists as Basis of New Industries.

Many years ago the northern part of Manitoba as far north as what is known as the "Barren Lands," was thickly covered with a forest growth of spruce, tamarac, jack pine and other northern trees. Great areas of this was timber of merchantable size and besides there were immense stretches of valuable pulp wood, but during the last 25 or 50 years millions of dollars worth of this, one of our most valuable natural resources, have been destroyed by fire. In many parts of the burned area a new growth has sprung up which is now well developed and in the course of from 15 to 25 years, if properly protected, will be an exceedingly valuable asset. However, outside of the burned areas there are still great stretches of valuable timber and pulp wood which, taken in conjunction with means of transportation now available, and the prevalence of water power near them in almost every instance, form an exceedingly valuable resource and one which should be protected, conserved and developed with the greatest care.

### *The Havoc of Fire*

Mr. J. B. Tyrrell has made frequent trips into the north country and perhaps to him more than any other man is due our knowledge of this resource, as well as much other information regarding the country. From Mr. Tyrrell's reports it is learned a great deal of timber in the territory in question has been destroyed by fire. On Grass and Minago rivers there is still some forest of excellent white spruce but on the northern part of Burntwood river this is rather scarce. Black spruce and canoe birch grow on the more level and imperfectly drained areas. The aspen is the commonest deciduous tree as it grown on the drier uplands everywhere, occasionally forming beautiful forests. "The forests surrounding Reed Lake are mostly of poplar, but there are some good growths of fine large spruce about 25 inches in diameter." On the southwestern shore of Lake Athapapuskow, "considerable areas are covered with large white spruce." At Wintering Lake, "the surrounding areas rise gently from the water and are densely wooded with close forests of white spruce, growing on the rich clay soil." An old fur station near Setting Lake was found by Mr. Tyrrell "considerably overgrown with large spruce trees quite indistinguishable from those of the surrounding forest."

In an exploration trip in connection with the Hudson Bay Railway, Mr. J. W. McLaggan covered the territory immediately north of The Pas and the following information is obtained from his report. The first portion is covered with small mixed timber. North of Cormorant Lake there are at least 5 million feet of good milling spruce and a very considerable area of the same south of Reed Lake. North of Herb Lake are spruce and poplar fit for railway ties and pulpwood. If fire had been kept out there would have been a big timber area in this district. Reafforestation is now being effected. Between Reed Lake and Elbow Lake he saw about two million feet of good spruce and poplar, averaging 12 to 14 inches in diameter.

In the report of W. Thibideau on an exploratory survey of the ground between Fort Churchill and The Pas in connection with the Hudson Bay route is found the following:

"All the timber between the head of the Little Churchill river and Churchill is reserved for fuel purposes.

The pulp wood belt as estimated below begins at Split Lake and extends to The Pas, ten miles in width on each side of the way proposed for route of Hudson Bay Railway. On this area, assuming one-sixth to be covered by pulpwood, the balance being river, lakes, ponds, swamps, etc., and assuming 10 cords per acre of an average of 6 inches in diameter, there would be 5,756,660 cords. This is a very low but safe estimate."

In 1910 Mr. J. R. Dickson, Dominion Forestry Branch, made an inspection of timber along the line of the proposed Hudson Bay Railway from The Pas to Split Lake. He covered a distance of some 235 miles along the line of railway. Mr. Dickson deplores the ravages made by fires in the past, but points out that a great deal of new growth will soon be suitable for pulpwood. He intimates that if general drainage conditions could in some way be improved so as to partially replace the black spruce with the white spruce the wealth producing power of the region would be immeasurably greater.

Mr. J. A. J. McKenna concludes each section of his report on the Hudson Bay route with a recapitulation or summary from which are taken the following:

"It would seem that after the Saskatchewan is spanned at The Pas, construction of a line of railway to Churchill would not be unusually difficult or expensive, and from reports it would appear there are in the intervening country stretches of fair timber. The country about the Bay has only been glanced at by explorers. Merchantable timber has been seen and vast stretches of pulpwood."

## LAWSUIT ON TREE VALUES

An interesting lawsuit has arisen from the burning over of a portion of the State Forest in Elk county, Pennsylvania, by a fire which was undoubtedly caused by sparks from a locomotive. The land burned over was covered with very young trees of little value at the time of the fire—but of large prospective value. The Department of Forestry claims damages on the basis of the value of the trees 60 years hence, when they would have been mature, discounted to the present at 3 per cent. interest. The railroad company insists on 5 per cent., which would make the bill considerably lower.

## "'UP-GO' OF LUMBER COSTS"

The Hardwood Manufacturers' Association has issued a little folder showing the comparative increase in cost of different articles.

**Costs.**

| | Percentage of increase | | Percentage of increase |
|---|---|---|---|
| Logs, bo't. on mkt. | 31 | Saws | 52 |
| Stumpage | 100 | Planer knives | 160 |
| Labor | 20 | Belts | 96 |
| Horse and mules | 10 | Packing | 32 |
| Oxen | 41 | Files | 101 |
| Feed | 76 | Emery wheels | 54 |
| Steel rails | 93 | Mill supplies | 58 |
| Railroad supplies | 88 | Coal | 137 |
| Wire rope | 91 | Freight rates | 8 |
| Manila rope | 103 | Stationery | 63 |
| Machinery | 60 | Federal taxes | 100 |
| Oil | 29 | Lumber | 12 |

## NEW ISSUES AVAILABLE TO ALL MEMBERS!

The Canadian Forestry Association will have ready for distribution in the near future two special illustrated pamphlets. One deals with, "What Ownership of the Forests in Manitoba, Saskatchewan and Alberta really means!" and sheds some statistical light on the agitation for "provincial ownership"; the second pamphlet undertakes to make clear the present situation in New Brunswick and to impress the need for a reconsideration of the Government's method of managing the Crown forests. Ten thousand copies of the first mentioned pamphlet will be given careful distribution throughout the West, and five thousand copies of the New Brunswick issue will be available for propagandist work in that province.

Balsa wood, found in Central America, is said to be the lightest known wood. It is lighter than cork, and has an average specific gravity of only .104.

# *Russia in the Wood Market*

The eyes of the world are upon Russia, not only because of the perilous turns of military fortune following the Revolution but from the sudden flood of publicity relating to trade opportunities after the war. Writing of the Economic Resources of the Russian Empire, Mr. Ernest H. Godfrey F.S.S. takes some interesting statements from a recent article by Baron HeyKing, Consul General for Russia in the United Kingdom, and makes comparisons with Canada. As Russia is certain to offer much greater competition to Canada in the export lumber trade of the world, the Journal reproduces the following excerpts:

"The north of Russia is covered with large stretches of forest land, much of which has not been properly surveyed. Apparently there are no estimates of the quantities of timber available; but Baron HeyKing considers that the supplies are practically inexhaustible and that Russia is bound to become the chief source of supplies of timber for building, navigation, wood pulp and other purposes. Next to the grain trade comes timber as an article of export from Russia; and it is stated that for the year 1906-10 the average annual exports of timber from Russia were 164,516 tons from the port of Libau, 633,709 tons from Archangel, 962,903 tons from Petrograd-Cronstadt and 262,-903 tons from Windau.

In area, Baron HeyKing informs us, the Russian Empire extends over half of the continent of Europe and a third of the continent of Asia and comprises not less than 8,760,000 square miles. The Dominion of Canada embraces an area of 3,729,665 square miles; so that Canada, large as it is, is only equal to about two-fifths of the great Russian Empire, which in size is second only to the British Empire, now placed at something like 13 million square miles. The Russian Empire stretches over 163 geographical degrees from west to east and over 35 degrees from north to south. It is larger than the United States, Canada and India combined and more than twice the size of the continent of Europe. If, in area, Russia and Canada present so great a contrast, in population the contrast is greater still. The Russian Empire contains a population which Baron HeyKing places at 186 millions, which is equal to that of the whole American continent and Australia or to the combined population of the United Kingdom, France, Japan and Italy. The population of the British Empire exceeds 440 millions. Canada, with a population of a little over 8 millions, has a density of less than 2 per square mile; the average density over the whole Russian Empire is about 20 per square mile, the figures for European Russia being, however, about 72 and for Asiatic Russia about 4 per square mile. Yet notwithstanding the great differences between Russia and Canada, which these figures represent in favour of the former, the case is altered when we examine the degree in which each country has developed its resources. Both countries have enormous potentialities; but the Dominion of Canada with its comparatively small population has made much greater progress in the development of national resources. According to the Russian Statistical Annual the railway mileage of Russia in 1914 was not more than about 39,000 which represents only three miles of railway to every 10,000 inhabitants and under half a mile to every 100 square miles of territory. In Canada, for the same year, the railway mileage was 30,795, a 38½ miles for every 10,000 persons and 0.8 of a mile for every 100 square miles of territory. This contrast is sufficient to indicate how backward the great Russian Empire is in the means by which its products must be made available for distribution, and what a vast field there is for enterprise and capital in this one direction.

# The Pulp Industry as a Conservator

(By J. L. Love, in "Canada Lumberman.")

Probably no industry sheds so much waste as lumbering. Competent authorities, such as Dr. John S. Bates, head of the Forest Products Laboratories of Canada, estimate the logging waste left in the woods to be about 25 per cent. of the original tree. It is just here that the pulp mill gets in its first good work in its mission of conservation, and that in a double sense. Every lumberman is familiar with the "slash" that marks the trail of the logger through the bush; the tops and branches that are left behind to choke new growth and add to the fire hazard. Where a pulp mill is operated in connection with the sawmill a large proportion of this "slash" is trimmed and sent down the drive with the logs to be made into pulp. Not only is this hitherto absolutely waste material turned into considerably more money value than its bulk in merchantable logs is worth, but the fire risk is reduced considerably.

Waste eradication in the woods is only part of the pulp mill's mission, however. Having accounted for all the tops four inches and up at the narrow end, the mill still has a large field for raw materials to draw upon in the waste from the saws. This waste amounts to about 40 per cent. of the original tree, and only a negligible part of it is used in developing power to operate the plant. A conservative estimate is that the total waste lumber for the pulp mill to work up amounts to between 60 and 70 per cent. of the tree, and of this less than half is available for pulp, but in spite of this margin of quite irreclaimable refuse, the above figures indicate that the pulp mill is doing its bit in the present world-wide campaign to cut out waste, and, incidentally to place the lumber industry on a more stable foundation than its own unaided feet have ever provided, of late years, at any rate.

There is a broad economic aspect to the operations of a pulp mill in addition to that already noted. A mill producing one hundred tons of pulp a day calls for two hundred cords of pulp wood. To provide this raw material requires larger lumbering operations than most concerns cover, and the farmer has to be called in to make good the deficit. Hitherto, clearing his land has been the bane of the farmer's existence, and it has been done largely only as government regulations compelled. Now, under the spur of high and advancing prices for pulpwood, land is being cleared as if by magic, and large sections of the reclaimed surface are being put under crop. The economic aspect of this is obvious. The farmer has more money to spend and industry is benefited right along.

## GOOD STROKES !

Readers of Industrial Canada may have been surprised during the past two months to see large advertisements for "Thrift In Forest Fires," in which were given reasons for keeping 1917 clear of needless loss.

The Provincial Paper Mills Ltd., Toronto, undertook to co-operate with the Canadian Forestry Association's work by using an entire page to set forth the message against carelessness with fire in the forest. Mr. I. H. Weldon, is President of Provincial Paper Mills, Limited, and a generous supporter of the work of the Association.

A half page advertisement was placed in the same magazine by the Howard Smith Paper Mills, Limited, Montreal, so that many hundreds of readers could not have failed to take some useful suggestions from the printed warning.

# Stories From the War-Front Forests

One of the mills of the Canadians behind the trenches in France runs day and night, and is rapidly eating up the neighboring wood. The noise of the circular saw mixes peculiarly with the constant throbbing in the air caused by the discharge of the heavy guns. A short distance from the saw-mill are the remains of buildings wrecked by enemy shell fire. A thousand feet an hour is the average output of the mill, and it will be doing better than this very shortly, as soon as the new machinery arrives.

Timber operations within range of German guns very naturally have their own peculiar inconveniences. Of course there is always the risk of the mill and its workers being blown to atoms by shell or by bombs from aircraft. Such dangers are part of the ordinary business of the day in these parts. The trees with which this particular mill is dealing have been "strafed" by the Boche intermittently for months past, which brings another problem to the workers in the mill. Chunks of shell are embedded in many of the trunks, and in the course of months these chunks have in many cases become overgrown and difficult of detection through superficial inspection, consequently there is trouble when such a trunk comes under the saw. But in spite of this and other difficulties the mill constantly turns out its thousand feet an hour, producing big balks for road mending and for the building of dugouts, lighter stuff for pit props and trench revetments, and timber of every kind which can be put to any use in the business of the war.

### *An Iron Cross Winner*

A journey of many miles from here into one of the fairest parts of France, into a part where the peasant even yet runs into the road to stare at the spectacle of soldiers in khaki, reveals still more of the Canadian foresters at work. They have a most interesting body of assistants—Boche prisoners. The German in the French woods seems happy in his lot. They seemed tractable enough, and went about the work with at least a show of interest. All were sturdy fellows; some elderly, but the majority in the prime of life. One wore the ribbon of the Iron Cross.

They were all in German uniforms of field-grey, but the head-covering was most varied. A good many had the round cap of the German infantry, others wore trench helmets, one or two had the woolen "comforter" cap such as was sent out to our own men in the winter, a few wore ordinary civilian cloth caps. Here and there at a short distance were the soldiers of the guard, from English infantry battalions. The guard was not numerous. One man with a rifle is capable of looking after a power of his fellows who cannot summon such a weapon among them.

### *A Prisoner's Meal*

Work was suspended punctually at midday, and the company trooped off to dinner. It was served out hot under the trees by the prisoner-cook. An imperial officer accompanying us spoke a sentence to the man in his own tongue and learned that the prisoner was a cook by trade. "I speak half a dozen Indian tongues, but I believe it is the first time I have tried to speak German for seventeen years," remarked the officer. Having duly received their portions in their tins, the prisoners squatted in groups under the trees and jabbered away to one another volubly. More potatoes were put away in that picnic of Germans in a French wood than many people had consumed in London during the previous couple of months.

Another long journey through most beautiful country and they reached a third Canadian mill. Save for the villagers the Canadians have the district pretty well to themselves, and here, again, they are rapidly letting daylight into the woods.

# What Kinds of Spruce to Plant

There are three species of spruce native to Eastern Canada, namely the white, red, and black, but the white is much the best for ornamental purposes, and the black spruce has not done well under cultivation at Ottawa, says W. T. Macoun, Dominion Horticulturist in "The Canadian Horticulturist." The black spruce grows naturally in swampy ground and appears stunted when grown in well drained soil. The red spruce, which is a very prominent tree in the Maritime Provinces, is a good deal like the Norway spruce in color of foliage but is not as graceful a tree as the Norway. The white spruce is, however, a very desirable tree. One should get the bluest specimens that can be obtained as individual trees vary much in color, some being much bluer than others.

This native spruce is a more graceful tree than the Colorado blue or Rocky Mountain blue spruce, but both are necessary. Where there is only room for one the preference is given to the Colorado blue, as one cannot get quite as blue an effect from the white spruce and the Colorado blue spruce makes less room. Moreover, the white spruce suffers from the Spruce Gall Louse, which in recent years has injured the appearance of it. The variety of Colorado blue spruce known as Kosteriana is particularly blue. They are obtained grafted. If one has a large place and needs many trees the cheapest way to obtain blue specimens of this spruce is to buy small mixed seedlings and select those of best color, as the Colorado blue spruce varies from a most attractive shade of steely blue to green, and all gradations are found in the seedlings.

Well grown specimens of the bluest shades are expensive. This spruce is one of the hardiest. It succeeds well in the prairie provinces, where the temperatures are very low sometimes. It is a rather slow grower, but eventually reaches a good height.

One of the best spruces is a western native species, Englemann's spruce, which grows in the Rocky Mountains. This does very well at Ottawa. It has a more graceful outline than the Colorado Blue Spruce and while the leaves are not quite so blue they are of an attractive bluish green shade. The Norway Spruce has been planted on private grounds in Canada, more, perhaps, than any other species.

There are several reasons for this. It is one of the cheapest spruces to buy; it grows rapidly; and it is quite ornamental particularly for the first twenty-five or thirty years. The Norway Spruce is the fastest growing spruce of all the species which have been tested at Ottawa. Its pendulous branches make individual specimens very attractive and its large cones add also to its interest. It has been much used for wind-breaks in the province of Ontario and is very desirable for this purpose.

Many hedges have been made of this tree and where they get plenty of light are quite satisfactory, but if the hedges are shaded they lose their foliage at the bottom. There are large numbers of dwarf, varigated and weeping forms of the Norway Spruce but none of them are very attractive.

The Servian Spruce is a beautiful species which it was thought was going to be hardy at Ottawa, but in a very severe winter it was killed.

## FRUIT TREES ON THE PRAIRIE

The climate that produces the finest wheat in the world is not favourable to fruit trees. However, with great care certain hardy varieties of apples can be produced in some sections. There are wild plums in Manitoba; a number of the trees were planted on the Dominion Experimental Farm in Brandon some years ago and there is now a fine orchard. The plums, which grow abundantly, are small but of fine flavour. Black and red currants, raspberries and strawberries grow very successfully.

# THE WORLD OVER

## AFFORESTING SAND DUNES IN CADIZ, SPAIN

*(De Castro, Manuel M. Ferandez, in the Revista de Montes)*

The "navazos" form a characteristic method of improving sandy ground. The author describes those at the mouth of the Guadalete on the pliocene which, in the course of time has become covered with a sandy layer and transformed into sandhills. The land was redeemed for cultivation by converting it into "navazos." It is possible to form a "navazo" wherever a shallow and pervious soil overlies a sub-soil which is only slightly pervious, so that, between the two, a layer of underground water is formed, which replaces irrigation by rising under capillary attraction. In the locality under consideration these strata are formed by the layer of sand and the pliocene respectively.

The land round the mouth of the Guadalete had been converted into a series of "navazos" placed next to each other. As sand continued to form, it at length became impossible to hold them any longer, and the abandoned 'navazos' rapidly became sterile sandhills. It was then that the question of afforestation was considered.

The afforestation was carried out in 1905 to 1913 under the direction of the engineer *Angel Fernandes de Castro* by means of stone-pnes (*Pinus Pinea* L.)

In those parts of the "navazos" which have not yet been invaded by sand, that is to say, in the ground that has been well manured by former cultivation, the trees have grown with great force, so that some seven-year-old pines have reached a height of over 16 feet, and there are annual growths of nearly 5 feet. Growth is slower on the higher ground which separates one "navazo" from another, but it is slowest in the ground where the sand has encroached.

The work of afforestation gave opportunities for various experiments. A group of closely planted trees was left to grow naturally, and it was found that the lower verticils of the *Pinus Pinea* died off completely, that is to say, a sort of natural pruning took place. Where trees were planted at normal distances from each other this natural pruning did not take place, and it occurred still less where the trees were sparsely planted. In the latter cases it is, therefore, wise to prune. Round Cadiz and Seville pruning is carried out very energetically, and the small branches which are removed are used for heating baking ovens. The pines which grow in abundance, also supply wood for the construction of river boats and fishing smacks.

## HOW INDIA'S FORESTS PREVENT TORRENTS

For over half a century, special laws have been passed in India for the protection of hill catchment areas by making reserved forests and protected forests.

The examination of abundant material collected in all the Provinces shows that the protective measures which were introduced during the last decades, and carefully carried out, have decidedly prevented de-forestation in districts where the effects of the denudation of the country had begun to be most severely felt. These measures were moreover taken at the right time. During the first half of the 19th. century, the destruction of the forests proceeded apace, as agriculture developed and villages increased. While the contractors cut down jungles, the villagers did still more

harm by uprooting stumps, grazing cattle on the young growth and firing the hillsides. The effect of such action was seen in the rivers, which became torrential during the flood season and shrank or dried up in the hot weather.

In the Central Provinces, it cannot be said that any wholesale denudation of forests has taken place, indeed, in some places the forests have improved rather than deteriorated. The same may be said of the Presidency of Madras. In accordance with these facts, the flow of the rivers and streams is equable. In the Punjab, the landslips, violent floods in the rivers, and the washing away of all cultivated soil in the Pabbi Range, the Hoshiarpur Chaos, the Siwaliks, the lower Himalayas and the Salt Range are doubtless due to the denudation of forest growth.

It can therefore be said generally that in most Provinces no serious damage to the flow of rivers has taken place, and no great injury has been done to cultivation. There are, however, local exceptions, and much damage has been done in the Punjab, in Bengal and Assam. Where damage was acknowledged, it was on the whole admitted to be due to forest denudation which changes the flow of the streams and accentuates their torrential character.

It may therefore be said that the measures of Forest Conservancy adopted by the Government of India during the last 50 years have entirely satisfied the climatic and hydrographic requirements of the country, and have resulted in the preservation of a sufficient area of forests, so that no widespread damage arising from the destruction of forest growth has occurred. This is chiefly due to the formation of reserved ann protected forests in the large catchment basins and if, as has been said above, inundations and floods have occurred in certain districts, these are due to the measures for forest protection not yet having been definitely enforced in these parts of the country.

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# *Disastrous Fires from Trifling Causes*

A man dropped a lighted match on the shore of Kalamalka Lake, British Columbia, on July 8th last. Within an hour a hot fire was racing through the underbrush. For three weeks after that there raged a series of forest fires, defying the organized efforts of hundreds of men.

At one time, 26 fire fighters were ringed about with flames while their relatives, shut off from them and helpless to aid, awaited news in terrorized suspense. Only after severe suffering from exhaustion, thirst and hunger did the band of workers force their way through to safety.

That experience is a big price to pay for one person's foolish act in handling matches in a forest. The court fined the careless man $50 but that does not help the province to bear the enormous loss.

One lighted match dropped on one inch of inflammable ground expanded into fifteen miles of ruin.

In the Spruce Valley fire of British Columbia of the same month, eleven men lost their lives, most of them tortured to death as they struggled over the mountain tops. The fuse to that disaster was supplied by a small piece of lighted tobacco carelessly thrown on the grassy floor of a tent.

Four out of five tragic holocausts could be avoided if every Canadian camper and fisherman kept vigilant watch on his own pair of hands, and every settler kept a tight rein on his clearing fires. It does not cost five cents or five minutes to put out a camp fire or a cigarette or a match, but it costs the people of Canada four or five million dollars a year to partially overtake the timber damage caused by runaway flames.

### BRITAIN'S HOUSING NEEDS

The necessity for the construction of a great number of houses for the working classes in Great Britain was made the subject recently of an important interview by a deputation which called upon Lord Rhondda, President of the British Local Government Board. One of the deputation stated that approximately 30,000,000 pounds a year was required to provide for the normal growth of the population in England and Wales alone. Mr. Russell Taylor, of Liverpool, state, that 500,000 houses would be required after the war in urban and rural districts.

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### PLANT COVER FOR A SANDY BANK

A Winnipeg member of the Canadian Forestry Association recently inquired for a means of planting up a steep sandy bank near his summer cottage. The sand had refused to take any form of plant which the owner had tried to place upon it. The following suggestions were made by the Dominion Forestry Branch:

"Evidently the first step is to get some plant growth established on the bank in question—at first some herbaceous growth, as trees would require some time in attaining the necessary size For this purpose the plant most generally used has been Beach Grass, known botanically as Ammophila arenaria; it is pretty common along the Great Lakes and is a vigorous grower, spreading by means of strong root-stalks. I do not, however, know of any convenient way for you to obtain seeds or plants.

Another plant that suggests itself is the Awnless Brome Grass (Bromus inermis), which is now pretty extensively sown in the Prairie Provinces. It has vigorous root-stocks, and soon forms a regular mass of roots. It thrives on loose and comparatively poor land and is especially valuable for its resistance to drought, and generally to sudden climatic change. It does not attain its most vigorous growth till the second season. Ten to twelve pounds per acre has been found the best weight of seed in the West. While I do not know of a case exactly similar to yours in which this grass has been used, I think it is well worth a trial.

A pamphlet published about a year ago by the Michigan Agricultural College (Lansing, Michigan)—their Special Bulletin No. 79—entitled "Michigan's Shifting Sands," gives a list of sand-binding plants suitable for use in that state and contains other information that may be of value to y u. You could probably obtain a copy by writing to the College.

Mr. E. J. Zavitz, provincial forester for Ontario (Department of Lands, Forests and Mines, Toronto) may be able to give you further information, as he has had quite a little experience in planting on sand lands in this province."

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Lt. A. M. O. Gold, a Danish Forester, formerly of the British Columbia Forest Service has left for England as an officer in the Forestry Reinforcement draft.

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There will be no more throwing away of good food if you keep a bottle of Bovril in the kitchen. Bovril helps you to make delicious dishes out of cold food. Better soup, better stews—less expense.

# Rock Splitting Power of a Tree

The great expansive power of tree-growth is shown in *The Guide to Nature*, by H. E. Zimmerman. Writes Mr. Zimmerman:

"Accurate experiments have been made by scientific investigators to show the remarkable power of growing plants. It has been found that comparatively delicate plants have, in their growth, lifted weights totaling hundreds of pounds. Some years ago a picture was published in *Strand* magazine, showing how a plant had pushed itself up through a hard pavement constructed of asphalt, gravel, etc. The growing power of a tree, especially after it has attained considerable size, is correspondingly greater. Contrary to what many people think, most rocks have seams or cracks of varying definiteness, or they eventually develop them through the action of rain, frost, and sunshine. Into these cracks, however minute, the rootlets of small plants penetrate, carrying with them a little humus, to decay and to be followed by other roots. Moisture follows, which freezes and cracks off small rock-particles, when larger roots find their way in, carrying more dirt. The crack, widening and deepening through the course of many years, becomes filled with drifting dirt, when perhaps a seed of some tree blows into it, and then the real process of rock-splitting begins on a larger and more rapid scale. If the rock has a well-developed seam the expansive force of the roots of a tree is likely to split it entirely asunder.

## SWEDISH STORES OF PULP

No less than 200,000 tons of wood pulp are said to be stored at Swedish ports awaiting sale or shipment. Much of the pulp held in storage has been bought and paid for by British dealers, but cannot be delivered owing to the Swedish embargo on shipments of wood pulp to that country. American buyers have abandoned their efforts to purchase wood pulp in Sweden. The Swedish Government now requires a guarantee that Swedish pulp exported shall be used in the country to which it is first shipped.

## A NOTE FROM A GUIDE

Burnt Church, N.B., June 22.

Canadian Forestry Assoc.,
Ottawa.

Dear Sirs:—

I received your card on the 10th instant asking to watch my camp fire etc. as never before, or my parties not to throw away any lighted cigarettes, so I will now watch and protect the forest even not my own parties but others that go about the woods.

Alex. Mitchell, Guide.

## ASSET IN CAMP DISHWATER

Lieut. Gordon B. Black, formerly of the "Western Lumberman" staff, Vancouver, was recently promoted from the Canadian headquarters staff at Shorncliffe to the position of assistant to the Director of Timber Operations in Great Britain and Scotland, with the rank of Captain, which was conferred in recognition of the high efficiency introduced by him in the task of supplying the needs of the various Canadian hospitals in England. Capt. Black writes that the conservation of food in the foresters' camps in England and Scotland is a live issue, as instanced by the fact that a new arrival was sent to the guard house for twenty days for throwing away a "hunk" of bread instead of placing it in the receptacle provided for food remnants. As a further instance of the saving methods in vogue, Capt. Black notes that the dishwater in all forester dining camps is skimmed twice. The grease thus saved is sold to the Imperial Munitions Board each week, the monthly revenue amounting to a handsome total.

The following telegram was sent to the "Timberman," Portland, Ore., by the Chief Forester of British Columbia, under date of August 13th:—

"May and June conditions were excellent throughout the province. July conditions were dangerous. Three hundred and fifty fires to date have been reported as the result of the hot weather and of no rain. The damage to property, including mills and logging equipment, is $60,000. Seven men and 11 horses were lost in one fire at Cranbrook. The timber damage has not been compiled.

Summarizing the whole western pine situation the "Timberman" said:

"Only organized and effective forest fire fighting has kept the loss to a minimum thus far this season. The timber loss has been nominal and that of equipment small in proportion to the amount endangered. With a few exceptions the fires have been confined to slashings, but it has been persistent and sometimes costly work that has limited the damage."


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# *Ten Thousand Canadians in Forest Corps*

Answering questions addressed to him in the House of Commons, relating to the number of men in the Canadian Forestry Battalions and their rates of pay, Sir Edward Kemp, Minister of Militia, made the following statement:

1. List of Forestry Battalions formed in Canada and which have proceeded overseas:

| Battalion | Officers | Ranks |
|---|---|---|
| 224th. Forestry Battalion | 47 | 1,536 |
| 230th. Forestry Battalion | 30 | 1,038 |
| 238th. Forestry Battalion | 44 | 1,084 |
| 242nd. Forestry Battalion | 44 | 1,006 |
| Total | 165 | 4,664 |
| | | 4,829 |
| Drafts | | |
| Drafts from various districts | 109 | 3,567 |
| Drafts from the 230th. Forestry Battalion Depot and not included in the 230th Battalion | 40 | 913 |
| 122nd. Battalion (converted upon arrival in England) | 26 | 686 |
| Total | 175 | 5,166 |
| | | 5,341 |
| | | 10,170 |

In addition to the above a large number of men already overseas were formed into Forestry Companies.

The following special rates of pay are given specially qualified men after arrival overseas; these rates include regimental pay and field pay of $1.10 per day.

| | Consolidated rate of pay. |
|---|---|
| Millwrights, 2 per Co. of 250 | $ 3.00 |
| Mill sawyers 2 per Co. of 250 | 3.00 |
| Edgermen, 2 per Co. of 250 | 2.25 |
| Saw filers, 2 per Co. of 250 | 2.25 |
| Engineers, 2 per Co. of 250 | 2.25 |
| Log setters, 2 per Co. of 250 | 1.75 |
| Cooks 2, per Co. of 250 | 1.75 |
| Saw hammerers, 1 per 3 companies | 5.50 |

# *Fines for Foreign-born Fire Setters*

Reports have recently been received by the Director of Forestry in regard to convictions secured by the officers of the Forestry Branch against Galicians who started fires which did considerable damage in the month of May on the Riding Mountain Forest Reserve.

One fire which burned over 1500 acres, and the damage from which was estimated at $1130, was deliberately set by a Galician who was caught in the act by the fire ranger. In spite of the fact that he was discovered setting fire with lighted grass on the edge of a hay meadow the man put up a strong fight and it was only after several hours in court that a conviction was obtained. He was fined $100 and costs.

Another Galician pleaded guilty to setting out a fire on his own place which got away. He endeavored to put it out and helped the patrolmen to extinguish it, so was fined the minimum fine of $25 and costs.

A third fire which ran over about 150 acres was also set out deliberately. The man who set the fire made a strong fight but was finally convicted and fined $50 and costs.

These convictions will undoubtedly have the effect of making the foreign born settlers more careful in their handling of fire.

---

Pennsylvania has about 2,000,000 acres of waste farm land,—land once cleared and farmed, but now abandoned.

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# Motion Pictures for Public Education

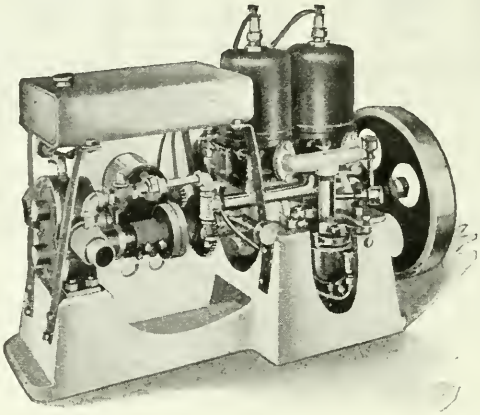
The Canadian Forestry Association has made a commencement in the use of motion pictures in educational work. One film that vividly depicts the tragic consequences of a neglected camp fire showing a forest in flames, burning buildings, a settler's family fleeing from the fire, modern methods of fire fighting, etc., is being circuited by the Association through the settlements of Ontario and Quebec. A second film will follow in a few weeks and, if the Association's financial condition permits, there will be several graphic films in constant use henceforth at small towns and villages in the vicinity of timber, each film covering two theatres weekly. Motion picture films represent a high initial cost and the risk of damage and loss is heavy.

## THE FUTURE WOOD SUPPLY

James White, deputy head of the Conservation Commission, recently paid a visit to Victoria, B.C., and, after a tour of the Pacific Coast province, stated that he believed the pulp wood resources were in the neighborhood of 250,000,000 cords. He said that the situation was, however, serious throughout Canada, especially in the far east, where the extent of pulp wood had been grossly overestimated. Cruisers in Eastern Canada and the United States had, in some cases, reported, that there was enough material to last fifty years. Later investigation had proved that about thirteen or fourteen years would be nearer the limit. Mr. White said that the result was that America must now look to the west for its supply of pulp wood. With the east facing exhaustion, British Columbia's pulp making woods were destined to meet a large part of continental requirements. Soon Canada would be the world's greatest source of pulp and paper. If regulated, the forests of British Columbia could continue to give six million cords of pulpwood per annum for an almost indefinite period.

## ONTARIO'S FIRE POSTERS

Some of the most striking posters issued anywhere this year have come from the Forestry Branch of the Department of Lands and Forests at Toronto. They are printed on paraffin-coated cardboard, in two colors, and will be certain to arrest the attention of settlers, campers, etc.



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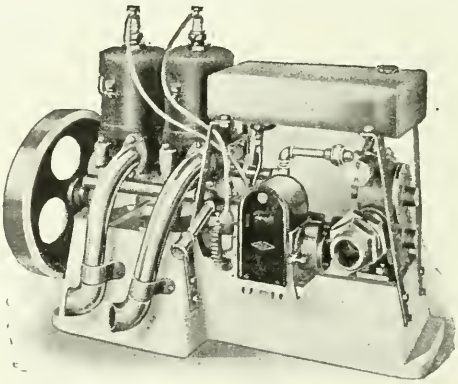

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# *Fighting Fires in the Pacific States*

An interesting report on the serious fire conditions on the Pacific Coast this year was issued by the United States Forest Service during August:—

"With the most serious fire situation in a number of years threatening millions of feet of western timber, it has been necessary for the Forest Service to suspend some of its operations in order to concentrate all available forces in fighting the forest fires.

"Reports received from the Northwest indicate that the situation is more dangerous than at any time this year. In Montana and northern Idaho two thousand men are fighting the flames under the direction of the Forest rangers. In these two States alone approximately $170,000 has already been spent this season, and that figure is increasing by approximately $15,000 a day.

"In Oregon and Washington valuable timber intended to furnish airplane stock for the fighting forces of the United States and its allies is being threatened by the flames. Logging operations are so badly interfered with that several large mills now supplying the Government with this class of material may be forced to discontinue operations. Numerous fires are reported as the result of incendiarism.

"The reports state that in many places little or no rain has fallen for weeks. The forests are now so dry that any fire which occurs is apt to become a dangerous conflagration, while high winds make it difficult to control even the smallest blaze. With such conditions, it is pointed out, there is need to keep all persons out of the woods. In order to accomplish this the Governor of Oregon has postponed the opening of the

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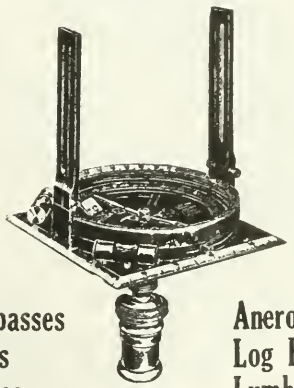

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hunting season in that State.

In spite of the unusually dangerous season, it is stated that until last week there has been a comparatively small loss of timber on the National Forests, private owners having suffered most of the damage done. This is largely explained as due to the increased efficiency of the fire-fighting force which has profited by the lessons of the past year. In many cases, too, luck has been on the side of the rangers in handling particularly dangerous fires. The outbreak of fires in the past few days is taken by officials to indicate that the situation is growing more serious.

The whole organization of the Forest Service, in the affected Districts, is devoting itself exclusively to fire fighting. In accordance with a prearranged plan, men from Forests where there are no fires are relieving the rangers who have been worn out by their long exertions.

While it may be possible to hold the damage to a minimum by these and other methods, officials say that not until the fall rains come will the danger cease.

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C. C. JONES, Chancellor.

# Ranger Jobs for Returned Soldiers

Several excellent suggestions have been heard in the Western newspapers that returned soldiers could well be employed in the work of forest patrol. A member of a local legislature went as far as to advocate a Ranger School at Prince Albert for the instruction of the soldiers in their duties.

The idea, excellent in itself, would not be acceptable for a moment to the parties most concerned, the returned soldiers, unless they could enter upon their work under a guarantee that the merit system and not the patronage plan would prevail in the conditions of their employment.

It is inconceivable that any soldier would accept the "boon" of spending five or six months at a Ranger School, only to find himself rated beside a political appointee who had monopolized the road to promotion through his personal "pull."

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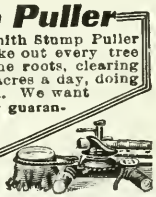

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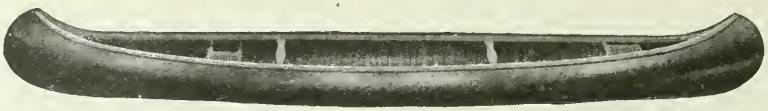

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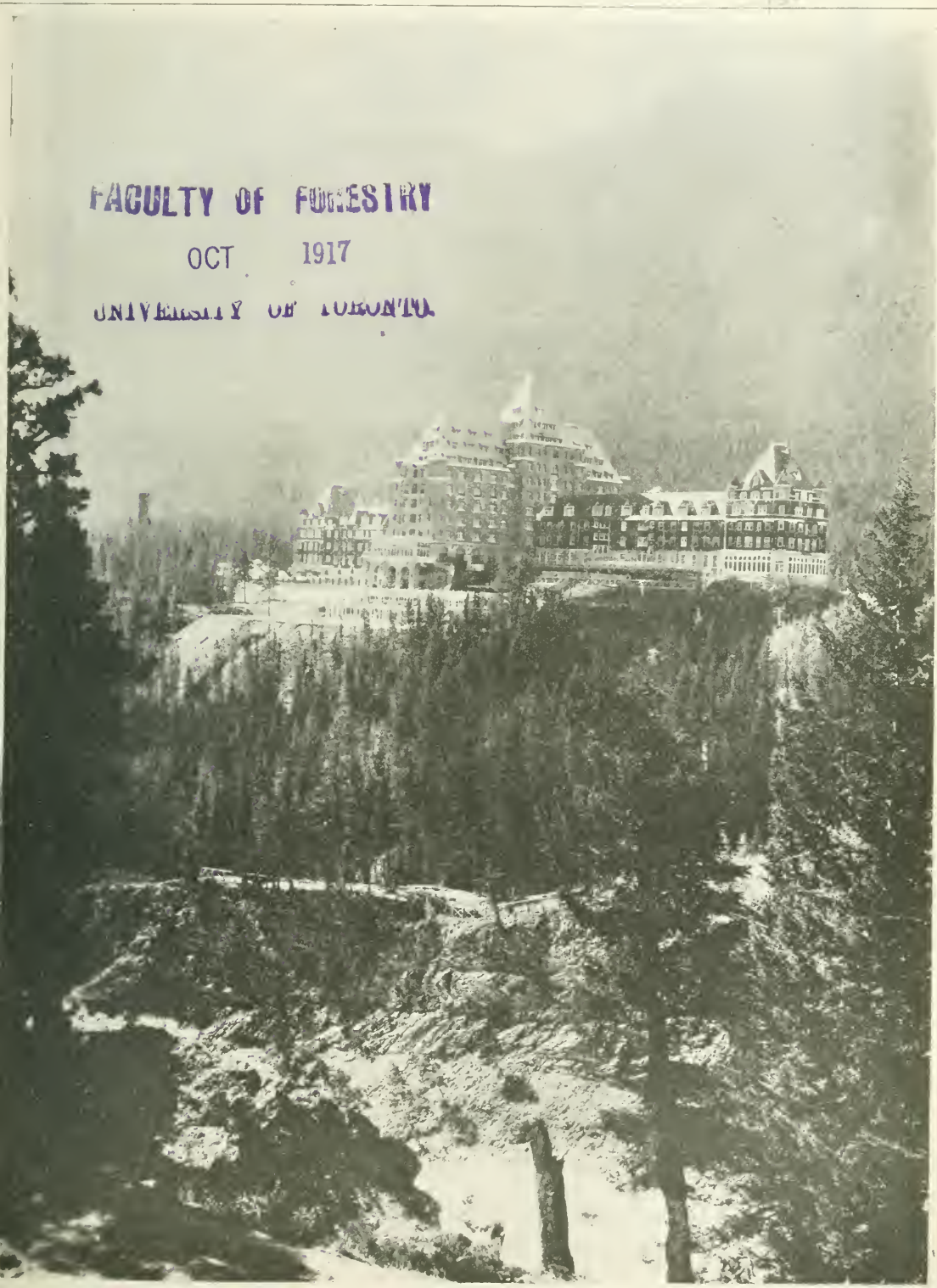

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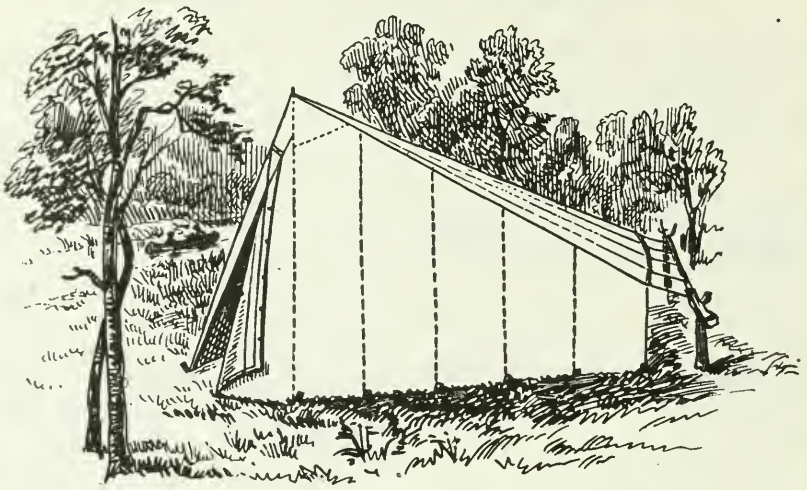

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How a 'protection belt' of trees pays good profit to the fruit grower. Orchards heavy with fruit are often protected so that loss from windfalls and broken branches is greatly lessened.

The above picture shows the progress made on the pine and spruce plantations on the sand lands near Lachute. The work has been in charge of Mr. G. C. Piche, Chief of the Forest Service, Quebec, and is showing up well. The trees were transplanted from the nursery beds in 1913.

# Canada's Foresters at the Battle Front

## Newsy Letters Telling of War Experiences in Forest and Trench.

Lieut. Alan E. Parlow, Forest Assistant, Dominion Forest Reserves British Columbia, in writing to a friend in Canada, says:—

"The Forestry Companies seem to have greatly impressed the French with their speed and efficiency though their methods are careless when compared with French practice. The experience of our lumber men in managed forests here should make a difference to their attitude when they return to Canada."

### *Fire Guarding in France*

Co. Q.M.S. Fred Fischer, Chief Fire Ranger, The Pas, Manitoba, (writing from the Headquarters of the Forestry Corps, France:

I may say that our district is doing fine work in the pine forests. The timber is fair average but owing to the custom of scoring the trees with long parallel cuts, the bark grows around these scars in ridges, making it necessary to take off a thick slab, which waste is however not lost as every particle of the tree is utilised even to the small limbs which are made into charcoal and the roots into fire wood. The practice of scoring the trees is to obtain the gum which is collected and after a certain process is made into resin products. This industry is of great importance in the country. You may therefore imagine that our operations are not looked upon by the natives with any degree of enthusiasm, as they depend largely on this industry for a living.

"The system of fire protection here is very good, if expensive, but the timber warrants the expenditure. The forests are generally divided into squares of about 100 acres or more by fire guards of about 200 feet wide which are cleared, ploughed and kept free from vegetation; wells are sunk at regular intervals insuring a supply of water, which is easily obtained at an average depth of 4 to 6 feet. Permanent fire guardians are also kept on the different estates.

(Fire guards are generally much narrower and the tendency is towards decreasing their width.—Ed.

### *On Howitzer Duty*

Capt. L. N. Seaman, Forest Products Laboratories of Canada, Department of the Interior: Since writing last I have been posted to a Howitzer Battery. We came out here over a month ago and have since been situated in a very warm corner of the line pushing over large pills towards Fritz with a long thrust, and I have good reason to believe with splendid precision and effect. It is hard work, and trying, but my knowledge of engineering has been of the greatest value to me in moving our piece.

### *Four-foot Beech*

Pte. Frank Haworth, Forest Ranger, Clearwater Forest, (writing from France: "This is a finely wooded country—some of the finest beech I ever saw. Some of them are as large as 3½ or 4 feet on the stump. Also some very fine oak. There seems to be very little softwood. Some pine, but very small."

Lieut. L. C. Tilt, Assistant to the District Inspector of Dominion Forest Reserves in Manitoba.

### *An Oak 6 Feet Diameter*

I was down to see an extra fine stand of oak recently in the Forest of Compiegne which runs about 50 M. ft. B.M. per acre. This is used as a park now and they are only cutting the trees that blow down. There are numerous oak there 30 inches, and 90 feet high. There is one they have named the Oak of the Allies. It is over 6 feet in diameter

and 110 feet high and is certainly a fine tree.

*A Tree Growing Proposition*

Pte. P. Mars, Fire Ranger in Coast District, Dominion Forestry Branch, British Columbia, (writing from France:

"The Germans destroyed all the timber in the part of the country where I have been lately, although I have seen some nice hardwood groves where they were unable to reach. They certainly have the method of destruction down fine. Allowing for them being as good at building up as knocking down it will take them some time to make this country what it was before they came into it, but I think they will get the chance to start on it pretty soon. Some job for them to put two hundred year old oaks back in three years."

*Lewis in Air Flight*

Lieut. R. G. Lewis, Head Office, Forestry Branch, Ottawa, (writing from France:

"I had my first flight in a machine yesterday when a French officer was kind enough to take me up for a quarter-hour flight. We circled around our own camp here and dropped a message in a metal tube. This fell in a field near camp and was brought in by one of the men who first took it for a bomb and then came in breathless with the letter which I enclosed thinking it was a warning of an air raid. I enjoyed the experience very much."

*The Beauty of England*

Gunner Jas. R. Dickson, Head Office, Forestry Branch, Ottawa:

"The beauty of England at this time of year is amazing and these quaint old towns along the channel are particularly charming. Hythe, for instance, with its picturesque, ivy-covered stone structures peeping out everywhere from amid the dense dark-green foliage of oaks and elms, and their porticos aglow with a wealth of Rambler roses, is a picture to be long remembered."

*Shavings at $5 per Load*

Lieut. W. J. Boyd, Head Office, Forestry Branch, Ottawa:

"Just the other day I bought two small wagon loads of ordinary shavings to use as standings in our stables and these English people had the cheek to charge a pound sterling per load. They could be had at any mill in Canada for carting them away.

*A New Objection to Logging*

Captain W. L. Scandrett, Forest Supervisor, Dominion Forest Reserves in British Columbia, (written from Narborough, England:

"I see by the bulletin that the Americans are handling the problem of war forestry in their usual thorough manner. They seem to require a great deal of timber over here (France) and both we and the Huns have already wiped out a great many of the little forests which were scattered about France. In parenthesis I might say that this has worried the airmen more than a little as we use forests for landmarks to a great extent, distinguishing them by their shape. It is a bit disconcerting when one's landmarks disappear or develop characteristics different from those shown on the map.

"The timber question is quite acute in England and sawn lumber worth its weight in gold.

"I am sure you will be glad to know that I am free of war dangers for some time to come (I hope) having been transferred to England "for a rest." I had just been under eleven months of active service with the Royal Flying Corps in France and was quite satisfied to take a turn of duty at home. They gave me ten days' leave, part of which I spent in the Cumberland Lake district, after which I was posted to the above place as an instructor. I have six machines, some of which will go, and my job is to give the final instructions to pupils before they graduate as pilots. I haven't a great deal of flying to do and have an assistant to help me so you may see I am pretty comfortable."

*Indian Ranger at the Front*

Private Matthew Nackaway, In-

dian Fire Ranger, Dominion Forest Service, Northern Manitoba:

"I wonder how Norway House forests are now. I never see water—it's all plains and lovely trees all around. And lots of steam engines. And we are building dug-outs. I guess I'll stay in dug-outs after I get back. And we are having a good time under the ground. I was wounded on the back with the shrapnel—just a slight one and only had to stay in the hospital for four days, but it doesn't hurt me at all.

"There's a lot of French girls here but I don't know what they are saying, but they keep on talking."

*No Kickers at The Front*

Major W. A. Lyndon, Forest Ranger on the Crowsnest Forest Reserve, Alberta:

"I spent five weeks in the Vimy Ridge district in front of Lens where we had some very hot work. So far I have been very lucky not yet receiving a wound but have had the unpleasantness of facing the gas. Our boys at the front are in great spirits always ready for a raid on the Bosch. They are always successful. If the young men could see the jolly spirits our boys at the front are in they would not need conscription in Canada. The kickers are the ones that stay at the base and in England and are afraid to face the music. Those are the ones that do the kicking."

*Campaigning in Egypt*

Captain E. W. Conant, Forest Ranger, Nicola Forest Reserve, British Columbia, (writing from Egypt:

"The country is, or rather was in April, a rolling, open country covered with short grasses, vetches and clovers, and had then on it a good many herds of cattle and sheep. Patched into this grass, looking rather like a gigantic chessboard, were large and small squares of cultivation, without any sort of protection from the stock. The cultivation consists principally of barley of a very fine malting quality and an excellent bearded wheat. The agricultural instruments are primitive but the ploughing and seeding is well done, the first quite straight, though shallow, the second looks as if done by a drill. Water is collected in the rainy season in deep cisterns and wells. It is a perfect sub-irrigation country from February to end of May, after which everything dries up and the Bedouins retire to the Jordan hills with their flocks. It offers tremendous opportunities to the white farmer as an enormous amount of water runs to waste in the spring down the large wadis which could easily be stored for summer use, and I should think deep artesian borings would be successful. As you can imagine, this kind of country after so many months of the desert simply sends one's horses mad. It was really comical to see them on the grass again. It was naturally a wonderful country from our point of view, ideal to us as a country for rapidity of manoeuvre, and we did some tall distances.

**"Well, I wish the war would hurry up and finish. I'm tired of the sun and glare and homesick for the dark green depths of a trail right up in the jack pine, and a bit of a lake with trout in it."**

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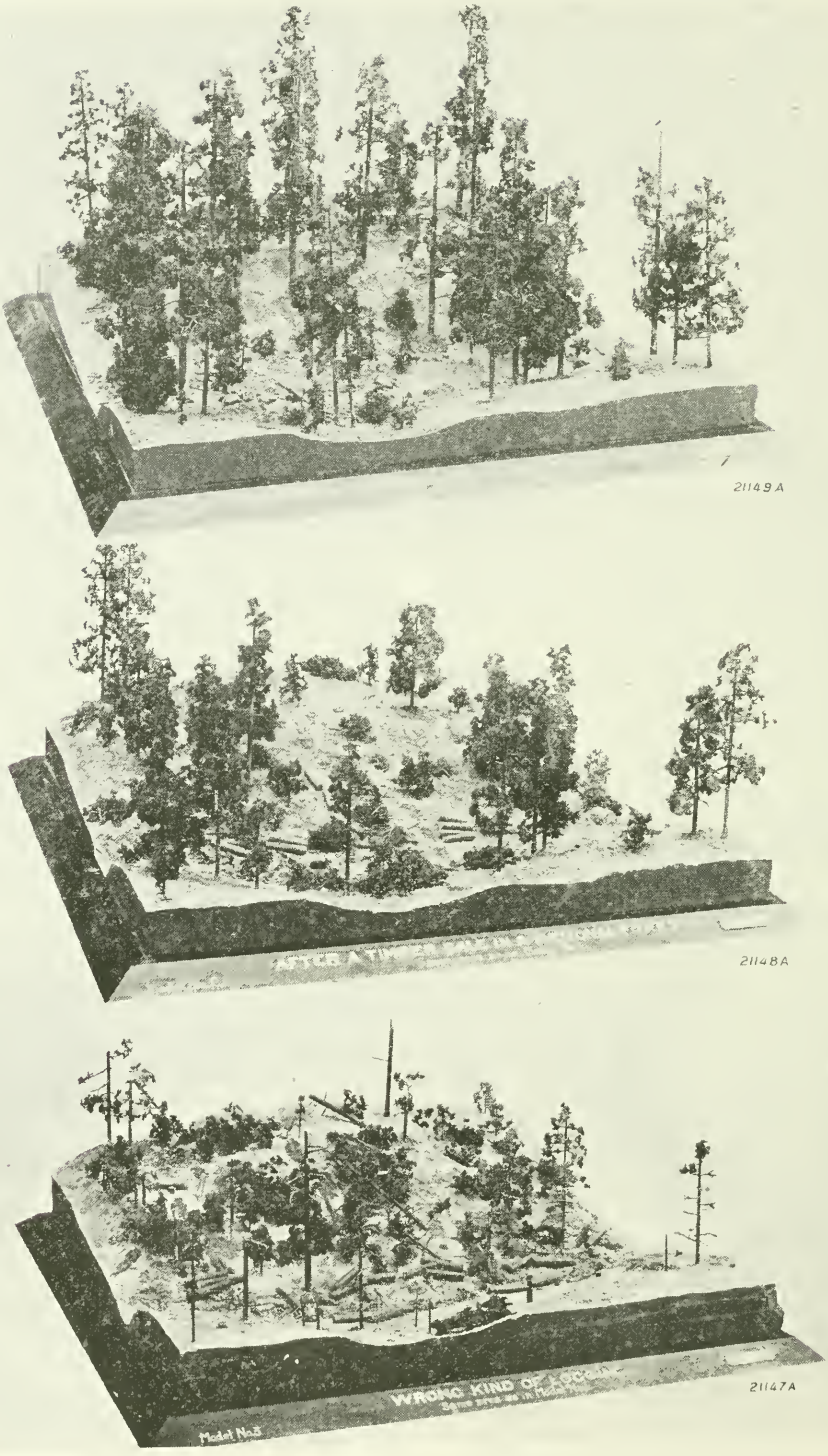
## A NEW USE FOR WOOD

The very latest wrinkle at soda fountains is the use of wooden dishes for serving ice cream and sundaes, replacing the cheap looking and flimsy paper cups that came into use a few years ago in response to the demand for a sanitary individual service. These wooden dishes are pressed out of very thin sheets of clear maple, shaped to slip readily into silver holders. They are tasteless, odorless and hygienic. The clean appearance of the cups seems to add an appetizing flavor to the frozen delicacy contained therein, and they are making a hit with the patrons of high grade soda dispensaries.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WRONG KIND OF LOG
Model No. 3

# *Taking Out Logs—Two Methods*

See Engravings on Page Opposite

The right and the wrong way to cut timber is shown by realistic models which the U.S. Forest Service has had prepared for exhibition purposes throughout the country. Three models are included. The first shows a stand of one acre of virgin timber, an actual scene in one of the national forests that has been produced on a small scale with great accuracy as to proportion and coloring.

The second of the series shows the same area after a timber sale conducted in accordance with the regulations of the Forest Service. The matured trees have been felled and cut into lengths which have been arranged in systematic piles to facilitate their removal from the forest. All of the brush and small limbs, which, if left on the ground would constitute a fire hazard, have been arranged in compact piles in readiness to be burned under the watchful eyes of foresters.

The third of the series shows an example of the wrong way to cut timber. Logs of various lengths are seen scattered about, no attempt having been made to arrange them in piles. Some of the trees felled have not been cut into lengths; many have been cut down without regard to size or maturity. All of the cut timber and trunks of the standing trees are charred and the condition of the ground indicates that the forest has been burnt over, the inference being that careless methods on the part of those engaged in cutting out the timber have resulted in the spreading of a forest fire which might otherwise have been checked.

## FRANCE'S WOOD CUT

The total annual cut of France amounts to 910,740,000 cubic feet, of which 225,920,000 cubic feet are timber, or a total cut of 39.39 cubic feet per acre.

## FROM A LIFE INSURANCE PRESIDENT!

"I have not been able to do what I should like in connection with the objects of your Association but I can assure you of my very great interest in it and my appreciation of the work that is being done and the great need of it.

"I have thought the best thing I can do, instead of enclosing $1, is to send you a cheque for $10 on account of the funds of the Association."

## AIDING QUEBEC SUGAR GROVES

Arrangements are being made by Mr. G. C. Piche, Chief Forester of Quebec Province for an inspection of the Quebec sugar groves by competent forest engineers with the object of directing thinnings and other improvement work. This will be hailed as a most desirable and progressive step, and ought to develop into regular co-operation between government and private owner in the management of woodlands. The sugar groves of Quebec, alone, are a very substantial asset and can be developed undoubtedly to surpass their present productiveness.

## QUEBEC'S GOOD MOVE

Quebec Province is preparing to devote more attention to educational work in connection with forest protection and utilization. It is probable that motion picture films will be made of forest scenes, brules, refcrestation work, wood utilization, water power development, etc.

## THE COVER PICTURE

The photographic reproduction on the cover this month gives a view across the beautiful Bow Valley, with the architecture of famous Canadian Pacific hotel harmonizing happily with its surroundings.

A corner of the British Columbia Provincial Tree Nursery.

# The Schoolground's Need For Trees

## Giant Buildings and Barren Surroundings the Rule. How British Columbia is Helping the Children.

In common with the lack of interest in shade trees on the part of most municipal councils, one encounters throughout the Dominion an equal lack of interest on the part of school boards and departments of education in the encouragement of tree planting about school grounds. This, of course, is an invitation to propagandist work which would well repay the effort. Within the knowledge of most readers of the Canadian Forestry Journal are beautiful school buildings, erected with every regard for internal completeness, yet displaying in the school grounds the barren ugliness of a sand dune. Nearly all schools are surrounded by plenty of ground, capable of growing beautiful trees at trifling cost, yet there would seem a remarkable lack of initiative in leaving such grounds for ten and twenty years without sign of a tree.

British Columbia has been conducting tree planting work on school grounds in such a way as to commend itself to other provinces. The following article by J. W. Gibson, M.A., Director of Elementary Agricultural Education at Victoria, B.C. will be found instructive:

"In 1914 the Department of Education for British Columbia adopted a policy whereby school boards wishing to undertake a scheme of school grounds improvment would receive financial assistance as well as free advice and a supply of ornamental trees and shrubs. For several years the Provincial Government had been supplying ornamentals for the beautifying of its own public grounds in various parts of the province, and

for this purpose had established a large nursery in connection with the grounds of the Mental Diseases Hospital at Essondale, adjoining the Government farm. As in other places so it was found here that this horticultural work and the new and healthful interests associating with it had a most beneficial effect on the men engaging in it. On the other hand, it made possible the production of large quantities of valuable trees and ornamental shrubs at a very low cost.

"In the fall of 1914 it was found that the supply of nursery stock on hand was more than sufficient to meet the needs of grounds in connection with provincial public buildings, and it was decided to make donations to school boards entering into an agreement with the Department of Education. This agreement provided for the complete planning, grading, draining, surfacing and planting of the school grounds, and was included as part of the work of the Director of Elementary Agricultural Education. In two years in the neighbourhood of sixty school grounds have been planned and most of the improvements carried out, including the planting of native trees as well as many beautiful horticultural varieties supplied from the schools' department of the Provincial Government nurseries.

"As it takes from five to ten years to raise most varieties of trees to a size fit for permanent planting, a movement was made in the spring of 1915 to provide for larger future demands by starting many of the best varieties of Canadian trees from seed, and also in 1916 by purchasing at a very low cost several thousand three and four-year seedlings which were set in the nursery and will be available for distribution from year to year whilst the younger seedlings are coming on.

"It is the intention of the Department to give more attention in future to the propagation of the best trees and shrubs which are native to British Columbia, not only in the provincial schools' nursery at Essondale, but also in others parts of the province. To this end a campaign has been started in the schools of the province with a view to interesting the teachers and pupils in the flora of their own respective districts. Teachers conducting school gardens are asked to include in each garden a forestry plot or bed for the propagation of native species from seeds and cuttings. During the past year some schools have done excellent work along this line. In this way it is

*Pictures by Courtesy Agricultural Gazette*

**British Columbia's tree nursery raises some choice evergreens for planting about the schools.**

hoped that the schools of the province will soon take on not only a much improved appearance, but also a truly national character, both as to teaching and general external setting.

"We also advocate that cities and municipalities having several schools to provide for should establish small nurseries for the supplying of suitable trees, shrubs and perennial flowers in quantity. Such a school nursery in a city or rural municipality might be directly connected with one of the larger schools. In this way the pupils of such central school would be able to do at least part of the work and would have no small advantage from an educational standpoint as a result of this. Already a move has been made along this line in connection with one of the schools in Vancouver City, and also in one of the schools in the municipality of South Vancouver.

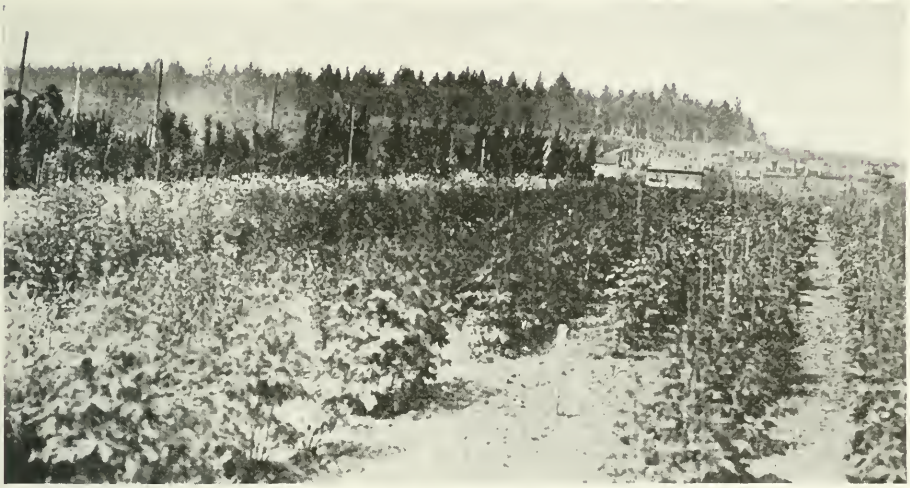
"Most of the provinces in Canada have adopted the policy of supplying free to schools many of the text-books used by the pupils. It is our intention in British Columbia also to supply in a similar manner that which will make school life mote pleasant and less monotonous—good playgrounds, carefully planned, well equipped and liberally furnished with our best Canadian trees and flowering shrubs. Our provincial schools nursery helps to make this possible."

### $35,000 UP IN SMOKE

In British Columbia one of the heavy losses of the fire season was at Campbell River, where the International Timber Co. sustained a loss of $35,000, The Kootenay district has sustained several fires, the worst being in the operations of the Kootenay Shingle Co.

One manufacturer of pulp building board in the United States sold last year an amount equal to 300,000,000 feet of lumber, and this same company expects to sell over 400,000,000 feet board measure in the year 1917. Remember, this was only one concern. Probably the total coverage by pulp substitutes will reach between 600,000,000 and 700,000,000 feet.

Hardwood Trees in the B. C. Provincial Nursery.



A view of the B. C. Provincial Nursery at Essondale.

# The Case For New Brunswick's Forests

By Robson Black

Secretary Canadian Forestry Association

## A Discussion of Present-Day Forest Conditions With Some Suggestions For Provincial Action.

WERE the whole of the Dominion of Canada inventoried after the manner of a personal estate, we would see five great natural endowments set forth in the order of their present day value:—

AGRICULTURAL LAND
THE FORESTS
THE MINES
THE FISHERIES
THE WATER POWERS.

From lands, forests and fisheries, the industry of man has taken toll for more than three hundred years. At first content to realize from the land merely the food, clothing and fuel of a family, improved facilities for trade and growth of population gradually reared a more complex commercial machinery until in most parts of the Dominion the raw materials of field and forest, mine and waters, can be sent forth today in a completely manufactured state. The natural resources themselves, however, remain the foundation of practically all human activity. Towns and cities are built upon faith in their inexhaustibility. Transportation lines have been directed into almost every corner of the country to turn these resources to general profit. Export trade with lands less generously endowed has grown to great volume.

In the days when the geographical bulk of the Dominion—so much of it unexplored and unassessed as to values—gave rise to prophecies of fabulous wealth, it was not surprising that the public should be blinded to the possibilities of depletion of mines or timberlands. Prognostications of inexhaustible resources in Ungava and about Hudson's Bay, in Labrador, and other sections of which accurate information was lacking, created an over-con-

fident state of mind readily assenting to incalculable losses from forest fires and to the damaging of other public resources regardless of the almost certain protests of the generations to follow.

## THE STATE AND THE NATURAL RESOURCES

Canada fortunately has progressed beyond the doctrine of "look out for yourself." At no time has the consciousness of a duty owed by the individual to the state, of the obligation of a Government to prepare for the future, been so deeply impressed as during this period of Canada's history. Public conviction and administrative policies are recognizing with startling frankness the duty of the State in managing not only armies of men, but the resources of the country on the most scientific far-sighted plan.

The care of forests in every province of Canada is the direct and undisputed responsibility of Governments. In New Brunswick, where provincial ownership of the forests has effect, the Government is to the fullest degree the trustee and steward of the 7,500,000 acres of Crown Lands, largely forest covered. While the province has undoubtedly followed the neglectful trend of almost all other parts of North America during the past fifty years, the ruin of so much of the forest inheritance by fire is attributable in the main not so much to the various political administrations, as to a lack of public knowledge and concern.

In whatever way we dispose of responsibility, the penalty must be faced. It is not in the desire of any good citizen to pass along old-fashioned mistakes unremedied. The Director of the Forest Survey of New Brunswick estimates that lack of adequate forest fire protection has, during the past forty years, resulted in the destruction of standing timber which, had it been manufactured instead of burned, would have represented a sale value of no less a sum than $80,000,000. In other words, the price of neglect is now being paid in a hampered industrial development, reduction of employment, capital turned elsewhere and the public's share of timber revenues cut down.

## NEW BRUNSWICK'S GREAT FOUNDATION

It would appear, therefore, that forest conservation is emphatically *public business.* While it is true that a larger proportion of New Brunswick's Crown Lands, than of other provinces except Nova Scotia, has been granted outright, nevertheless there remains under the Crown, 7,500,000 acres (mostly under license) averaging as good timber contents as are to be found in the province. This area, about the size of Belgium, represents, with farm land, the chief natural endowment of the province. It represents the future source of raw materials not only for the hundreds of wood-using industries in existence today (needing two hundred million feet of raw material a year for the Maritime Provinces alone,) but is the main hope of attracting scores of new wood-using factories, increasing employment, developing farms, towns, and cities and providing new revenues for the public treasury without resort to direct taxation.

No longer is the forest to be indentified with the "wilderness." It has come to be regarded in all progressive lands as one of the most vital and valuable portions of the people's estate. No longer does the farmer look upon tree-covered areas as necessarily impeding the progress of agriculture. He knows, sometimes by hard personal experience, that by far the greater part of New Brunswick is limited by nature to the growing of trees. Soil, climate, and topograhpic conditions together render more than two-thirds of all Canada unable to produce field crops. In Quebec, for example, out of a total area of 210 million acres, less than 9 millions are under farm cultivation. The balance is either permanent barrens or must for the greater part be retained for all time under timber. Undeveloped agricultural areas, like the Clay Belt, constitute the exceptions, but such areas comprise but an exceedingly small proportion of the unalienated Crown lands. Similarly, Ontario will

probably always have not more than one-third of its total area fit for the plow. This happens to be a balance fixed by nature and the part of wisdom is to realise not only from the tillable lands, but the huge untillable areas every dollar of profit that may be derived.

## SWEDEN'S $5,000,000 FOREST INCOME

An interesting illustration is afforded by Sweden. Its latitude is much higher than that of New Brunswick while it is six times greater in area. Sweden realized early that the eggs of prosperity are not carried necessarily in the one basket of agriculture. Enormous forests, growing on soil no better than New Brunswick's, within short reach of the European timber markets, promised splendid returns if properly managed. "Proper management" of course, meant not the hit-or-miss exploitation that characterizes so much of Canada's forest development, but scientific care in the growing and harvesting of timber as a crop. What the yield of a given area would be fifty years hence was of more importance than the catching of a momentary profit. Fire, the arch enemy of forests, was met and overcome. Fire, indeed, has in the main, been successfully excluded from the great forests of Europe for from fifty to one hundred years. Conservation and good forest management are meaningless terms as long as the plague of flames sweeps off in a week more than the constructive forester can accomplish in ten years. Today, Sweden is taking from her forests, as the dividends of fire protection and sensible development (and without impairing the precious "capital stock" of timber as New Brunswick does), no less a sum than $100,000,000 a year, representing

*Continued on Page 1349*

**The good effect of keeping live stock out of the farmer's woodlot. No grazing has been allowed on the section to the right of the rail fence with the result that a fine crop of hardwoods has succeeded in getting a foothold.**

# *Beautifying the Railway Lines*

In the beautifying of public grounds and streets, Canada as a whole can hardly be said to set a world standard. There are, fortunately, sufficient local exceptions to demonstrate what excellent effects can be secured when the right kind of initiative is shown. The Canadian Pacific Railway has exerted itself to secure the improvement of station grounds, the results of which are visible in almost any rail journey. The Grand Trunk has interested its officers in similar projects. Along the lines of the Canadian Northern also may be seen the pleasing substitution of beautiful trees and shrubs and flowers for what was recently an ugly level of slag or patches of coarse grass.

The accompanying picture shows the good work of Mr. A. W. Gonder, Canadian Northern Agent at Carberry, Manitoba. There are about 200 balsam fir and spruce trees on an enclosed lot of 75 x 300 feet, all in thriving condition. The grass is well kept and the whole aspect of the station greatly improved. Another evidence of the improvement caused by flower and tree planting may be seen at Rosedale, B.C. on the Canadian Northern Railway.

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### A HELPFUL MEMBER!

From a leading Western lumberman: "I am a member of the Rotary Club and two or three weeks ago at one of the weekly meetings I called attention to the necessity of every member of the Club subscribing to the Forestry Association and taking on interest in its work. I intend calling attention to the Association again in a week or two—and will try to induce all to join."

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It is estimated there are three million acres in the state of New York in wood lots. The cut of lumber is about 300 million feet annually. The state owns about 1,800,000 acres of forest land which is in process of being reforested. The bulk of this land was purchased at a low figure. The later purchases were made on a basis of $5 to $10 per acre. A bond issue of ten million dollars was submitted and carried by the people with which to furnish funds to purchase the denuded forest lands, susceptible of reforestation.

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The problem of reforesting areas that are otherwise unproductive, should be considered by agriculturists. Perhaps next in importance to the disposal of brush and slash is the effect of close cutting on hillsides. In many instances, the clearing of trees from a slope has encouraged a washing of soil that not only ruins the slope but also buries the productive field at its foot and greatly increases the damage done by brooks at flood conditions.

# Do Electric Wires Damage Trees?

## A Point of Much Concern to Tree Owners Discussed By Authorities.

Can any deleterious effect be traced to electric wires strung through branches of shade trees? What are the possibilities of injury from this cause?

These questions have been asked of the Forestry Journal not only by those owning shade trees on town streets but by a reader identified with an electrical transmission enterprise in Ontario.

By the kindness of Prof. G. H. Collingwood, of Cornell University, who made a search for some authentic information on the subject, the Journal reproduces part of a bulletin issued by the Massachusetts Experiment Station. "It is rather interesting to note," writes Prof. Collingwood to the Journal, "that this bulletin states that alternating currents are apparently less injurious than direct currents although this may be because alternating currents are usually carried on high powered transmission lines across country and are therefore less often in contact with shade trees.

"Most of the injury to trees from trolley or electric light currents is local," reports the Massachusetts Station. "The injury takes place at or near the point of contact of the wire with the tree. This injury is done in wet weather when the tree is covered with a film of water, which provides favorable conditions for leakage, the current traversing the film of water on the tree to the ground." The writer of this bulletin never found leakage in dry weather.

*Resistance of Trees*

"The electrical resistance of trees is so high that it is doubtful whether injury ever occurs to them from contact with low or even high tension wires, except that produced by grounding when the bark is moist. Any escaping current from transmission lines that can be transmitted even through the least resistant tissue is likely to be insignificant.

"It might be possible for direct currents to affect trees without causing any perceptible burning. If, for example, a tree were subjected to a sufficient strength of current, there might occur a disintegration of the cell contents, causing the tissues to become abnormal and finally to die, but the electrical resistance of trees is so great that a quite high potential would be necessary.

*Other Causes at Work*

"On the whole, the cases of death to trees from electricity are by no means so numerous as is generally believed. Because a large number of trees near electric roads, etc., often look sickly it must not be concluded that electricity is always the cause. In cities and towns, where most of these unhealthy specimens are found, there are innumerable destructive factors for trees to contend with. It is quite essential in diagnosis work, therefore, that all these factors be taken into consideration before a definite opinion in regard to the cause of any abnormal condition is formed."

Readers will also be interested in what Dr. Fernow states in his book on "The Care of Trees:

*Watch the Wire Stringer*

"Every tree owner should look out for the wire stringer, who not only disfigures the tree by chopping off branches, regardless of consequences, but introduces the danger of electrocution. Trees and branches, beating against electric wires in winter storms, wear off the insulation and thus establish short circuits, which under certain weather conditions as, for example, in a thunderstorm, may bring about the total destruction of a long-cherished tree.

"According to the latest investigations there is a difference in the effects of direct currents which are used chiefly in operating electric

railroads, and of alternating currents of the electric light plant, which, although carrying a higher current, appear to be less disastrous.

*Burns the Limb*

"In moist or wet weather, when the tree is covered with a film of water, the current causes, at the point of contact, an injury to the tree, which provides favorable conditions for leakage through the film of water, grounding the current and burning the limb, partially or entirely killing the cambium at point of contact, and drying out the limb above. With alternating currents the damage seems usually confined to this local destruction at or near the point of contact as a result of the heat created. With direct currents, in addition to these local burnings, electric effects are sometimes noted a- a distance, the escaping current girdling trees at the base, and killing the cambium without the characteristic burning at point of contact or at point of discharge. This appears to happen only when the positive current is not as usually carried by the feed-wire, but by the rail, and leakage through imperfect rail-connection occurs. In an observed case the damage was done when the trees were four feet from the rail, the moisture conditions of soil and bark being evidently most favorable for electric discharge."

"The only help is, of course, to string the wire outside of the tree line, or at least to prevent contact, keeping in mind that winds will sway the branches and that allowance must be made for this."

# *The World's Bid For Quebec's Forests*

How the people of Quebec are benefitting from the world-wide advance of timber values is shown by a comparison of timber sales conducted by the Quebec Government last month and those held 14 years ago.

In 1903 the average price received by the public treasury for timber berths was $111 a square mile. In the following year it was $138 a square mile. In September, 1917, the bids averaged $440 a square mile, one substantial tract going at $1,000 a square mile. This enormous advance does not represent a speculative value because the purchasers were industrial companies intending to turn the forest growth to more or less immediate account.

Quebec tax-payers owe to their forests their freedom from direct taxation. Last year no less a sum than $1,683,000 was taken by the Quebec Government as forest revenue and this paid a great part of public administration, road construction, public buildings, etc. The year before Confederation, Quebec took from the lumber industry a net total of $294,000. In 1866 this had risen to $630,000 and by 1905 was $1,280,000.

Every tree in Quebec is growing more and more valuable. The industrial development and volume of employment grows greater year by year, and the public treasury is a substantial gainer. Quebec cannot afford to hand over any part of her forest endowment to the needless waste of fire. Every fire represents a blow at employment and the public good.

**1500 PAPER CASUALTIES**

Amsterdam,—The Bayerische Landes Zeitung, of Warsebourg, before discontinuing publication says that the war has proved fatal to the economic situation and the German newspapers generally. One thousand five hundred newspapers and periodicals have already ceased publication, and the war has made demands on the German newspaper industry which are characterized as frightful and entirely unexampled. Paper has reached a price which enabled most paper mills to increase dividends considerably.

**New York State's Tribute to the Importance of Scientific Forestry. The new $250,000 Building of the State College of Forestry at Syracuse.**

# *How New Bird Protection Will Work Out*

By Dr. C. Gordon Hewitt, Dominion Zoologist

The International Convention for the protection of migratory birds in Canada and the United States, ratified in December last, constitutes the most important and far-reaching measure ever taken in the history of bird protection. It affords the best means of ensuring not only a cessation of the decrease in the numbers of our migratory birds such as the insectivorous birds, the wild-fowl, waders and sea birds, but, in many cases, it assures an increase in their numbers, which have been ruthlessly depleted. It affects over 1,000 species of our chief insect-eating and game birds. It guarantees to the farmer the continued existence of the insect-eating birds, the most powerful and active allies he has in the fight against the destroyers of his crops; and it guarantees to the sportsmen a never-failing supply of ducks, geese, and other game birds.

In fulfillment of its obligations under the Convention, the Canadian Government introduced the Migratory Birds Convention Bill to carry out the provisions of the Convention, and this measure has recently passed both Houses of Parliament. As soon as assent is given to the bill, regulations will be promulgated fixing close seasons.

In the case of insectivorous birds,

it will be unlawful to kill them or to take their eggs at any time of the year. The close seasons on ducks and geese will not exceed three and one-half months, and the dates of opening and closing will be fixed in accordance with local conditions and after consultation with the proper authorities in the different provinces. On a number of birds, such as the cranes, swans, curlew and most of the shore-birds, with the exception of woodcock, snipe, certain plover and yellow-legs which are becoming greatly reduced in numbers, a close season of ten years will be provided. The wood duck and eider duck will also be given special protection. Where they are injurious to agricultural or other interests, provision will be made for the killing of protected birds under special permit. Regulations will also be made to prohibit the shipment of migratory birds or their eggs during the close seasons and generally to govern the traffic in them and their eggs.

While the numbers of the migratory birds in Canada and the United States have been most seriously depleted by various causes confidence is felt that, with international co-operation, and, particularly, the prohibition of spring shooting, a gradual increase in the abundance of our wild bird life will take place.

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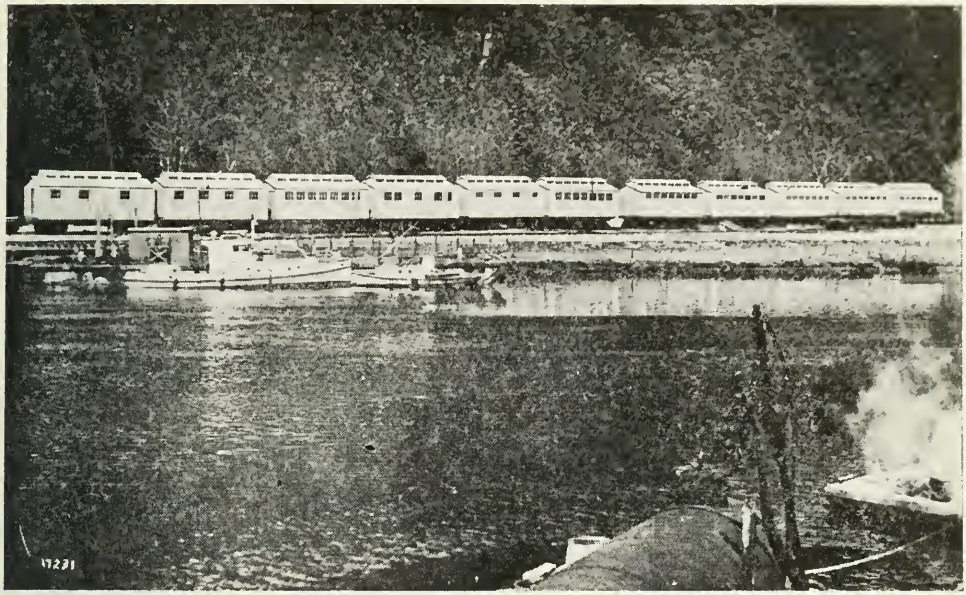
## FIXING THE GUILT FOR SPREADING FIRES

The decision of the Supreme Court of Washington in the case of Carrie Sandberg vs. Cavanaugh Timber Co., wherein it is held that the owner of property upon which a forest fire starts, and spreading, damages a neighbor's property, must pay has just appeared. One important feature of the decision is that the original property owner's responsibility is fixed no matter how the fire started. In this case the fire began in the logging operations of the Cavanaugh Timber Co. upon its own land. The decision closes thus:

"Contention is made in appellant's behalf that the evidence introduced upon the trial does not support the judgment and verdict, in that it does not warrant a finding that appellant did not exercise due diligence looking to the prevention of the spreading of the fire to respondent's property. A careful reading of the evidence convinces us that this was a question for the jury. The fire was traced, by creditable evidence, directly from the place it started upon appellant's land to respondent's property. It occurred early in August during a very dry season. It is true, appellant used some effort to stop the fire a day or two following its starting, but very little effort thereafter. On the second or third day following, appellant's foreman was warned by a fire ranger that the fire was proceeding towards the east, threatening the property of others. This ranger also testified that, in his opinion, the fire could have been subdued had proper efforts been used in that behalf. Respondent herself testified that, about one and a half hours before the fire reached her place, she warned appellant's foreman by telephone message of the approach of the fire to her place and asked for help. None was furnished by appellant, according to her testimony. Whether or not her place could then have been saved is somewhat problematical. We deem it unnecessary to pursue this inquiry further. We are quite clear that the question of appellant's negligence, so far as the question of its efforts to control the fire are concerned, was for the jury to decide.

"Some contention is made in appellant's behalf that the verdict is excessive. A reading of the evidence convinces us that there is ample room for difference of opinion upon that question, and we are therefore constrained not to interfere with the jury's award of $2,000 to respondent.

"The judgment is affirmed."



## A MODERN CAMP TRAIN

The North Coast Timber Co., of Tacoma, Wash., has just completed a new logging camp equipment, capable of housing 130 men.

It is regarded as the latest word in the modern housing of men on wheels. The camp train consists of men on wheels. The camp train consists of 17 standard cars.

The blacksmith is provided with all modern tools. The filing car is divided into two sections, fitted with two benches and lighted by a skylight.

The bath and drying rooms are combined in one car.

The library car is 11 x 42, equipped with six tables and shelves for books. The car is painted white and is supplied with several rocking chairs.

Provision has been made for housing the train men and cooks in one car.

A kitchen car, with a dining car at either end, makes adequate provision for feeding the crew. The sleeping cars are 11 x 42, each with accommodations for 16 men, and are provided with end doors. Steel bunks are provided, with a window for each bunk. In the arrangement of the cars a 16-foot clear space is left for a sitting room.

The camp train is lighted by means of an Edison storage system of 100 lights and is heated by steam. Every provision for the comfort of the man has been made.

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## SMALL POWER PLANTS A FARMER'S AID

In the study of wood using industries N.Y. state foresters have discovered one Onondaga County man who has an interesting water power saw mill with which he does custom sawing. When the power is not needed for the sawmill he runs either a grist mill, or a cider mill with it. He also has a small electric light plant which is operated by the same power. The mill has been in operation for more than twenty-five years. Full and profitable utilization of the woodlot products will be assured only when the State is dotted with these "many-purpose" mills which were so common in former days. Cooperative mills are suggested as a good financial move in New York farming communities.—*N. Y. State College of Forestry Bulletin.*

# Covering the Sand Lands With Trees

The splendid work done by the District Agricultural Representatives of the Ontario Department of Agriculture is now being utilized to a degree in the cause of forestry. With the sanction of the Minister, some refoiestation experiments have been carrred out by the District men, as is explained in the following statement referring to one of the districts:

"In a number of places throughout the county there are sand hills upon which apparently nothing could be made to grow, and which give an endless amount of trouble, especially along roadsides, where every windy day fills the road full of sand. One particularly bad hill lies on the road about midway between Kemptville and Spencerville, on the Selleck property. This sand hill has drifted across the road allowance, and several strips of land have been purchased from the owner of the adjoining field, in order to get around the sand. Every effort to stop sand blowing has failed, three high board fences have been buried, and it is an every day occurrence to see autos stuck in the middle of the road.

"With the idea in view of attempting to stop the sand blowing we decided to conduct a reforestration experiment, to see if it would be possible to grow trees on this sand. Five thousand four hundred trees were secured in the spring from the Forestry Branch of the Department of Agriculture, and set out carefully in rows four feet apart, with the trees four feet apart in the row. We further experimented by hauling cedar brush and covering over half the area with it. I am pleased to state that at present nearly all the trees over which we put brush are living and doing well. These will, no doubt, in the course of a year or two stop the sand from blowing. The trees which we did not cover did not do so well, and many of them were either covered with the blowing sand, or blown out by the roots. Next spring we purpose replacing all dead trees. and covering the entire area, if possible, with cedar brush, to give the trees as good a chance as possible.

"Very little encouragement was given by adjoining farmers at the time the trees were planted, and a good deal of scepticism prevailed as to the possibility of the trees growing. However, we know that seeing is believing, and trust to have this troublesome sand hill converted into a young pine grove in the course of a few years."

# The Tree's Value to the Prairie Farmer

By Allan Campbell

Trees on the farm perform a similar office to that of the paint on the buildings, as they improve appearance and are a good protection against various conditions of weather. The treeless farmstead is open to every caprice of the weather and in addition to this must in time prove depressing to the spirits of those who live within its bare environments. Particularly in this western country do we need farms that are homes in the true sense, and in this direction tree planting can accomplish much, both from a sentimental and economical standpoint. The farmer who has to face the ordeal of an annual long haul to obtain his winter's fuel supply would feel a greater peace of mind could he contemplate on a certain part of his farm, hundreds of sturdy saplings growing his future fuel supply.

For ornamentation and shelter, trees form an essential on the modern

farm and the best means of comparison is for one to stay on a treeless farm for a short period and then stay on a well treed farm. In the case of the former, one feels that home is just a figure of speech and in time becomes surfeited with the feeling of being too much outdoors and among the elements. There is a good choice of trees for the purpose of establishing a prairie home; the Green Ash, with its slender leaves, the Mountain Ash giving a splendid display of little red berries in the fall among its rose-like leaves, the Birch with white bark standing out in bold relief from the general environment of green. The Asiatic Maple is another tree of great color effect, as the leaves turn from green in the summer to crimson in the fall. These, with a background of evergreens, form a picture of extreme beauty in the fall. Flowering shrubs such as Lilac and Honeysuckle are an annual source of pleasure to their owners and others who are favored by their sphere of influence. Mention must be made of the Caragana, a favorite hardy hedge maker. It forms a tight hedge, is a good grower and bears a pretty yellow bloom. In evergreens, the Spruce and Scotch Fir form an all year green shelter and a most efficient windbreak.

A plantation of Cottonwoods becomes a fuel yard in the making and the rapid growth of these trees makes them a worth-while proposition to the average farmer.

Trees may be acquired by various means, viz., from the woods, purchased from nurseries, and grown from seed. It is better to thoroughly thresh out the question of planting before actually putting it into practice. A pencil drawing of the proposed layout is a good initial step and is easily altered to accommodate the desires of second thoughts that may crop in, whereas, should the planting be accomplished before thorough consideration has had full scope, any alteration involving the labor of transplanting may prove fatal both to the trees and the ambition of the planter.

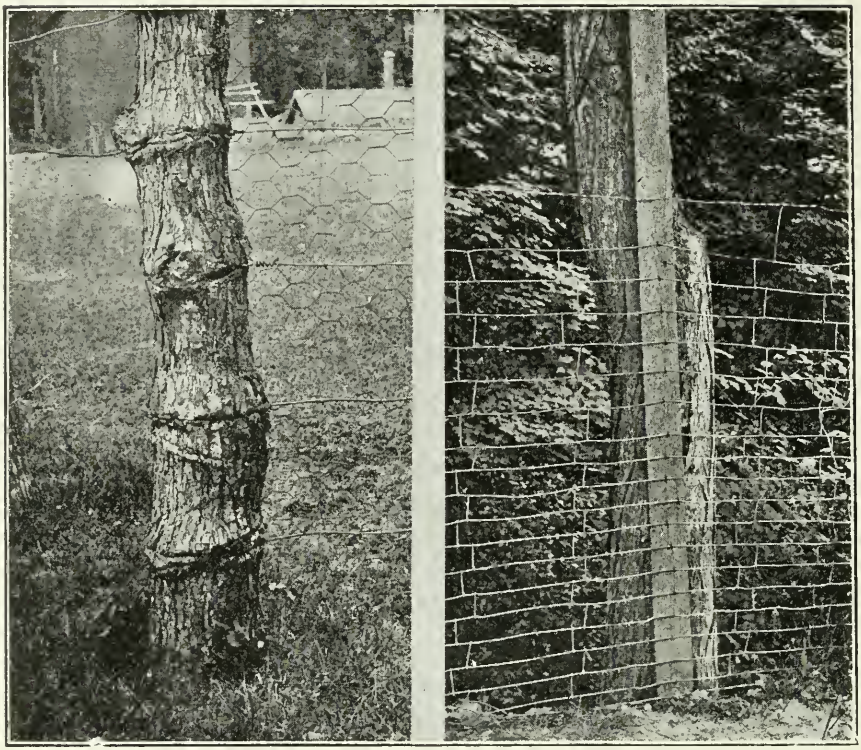
# *Notes on the Western Fires*

Forest fires in the Coast district have been numerous owing to the long spell of extremely dry weather, but so far the International Timber Co., Ltd., has been the only heavy loser on the Coast, says the Western Lumberman of Vancouver. A serious fire broke out August 3 in the company's limits at Campbell River, Vancouver Island, destroying about 7,000,000 feet of timber cut at Camp Three, and seriously damaging a lot of valuable logging equipment, including an overhead system and five donkeys. The loss will run into big figures, but M. D. Rector, general manager, is not yet in a position to name the amount.

In Vancouver district the Taylor & Naysmith Lumber Company, operating a sawmill and logging camp north of Burnaby Lake, met with misfortune on Sunday, August 5, when a fire which started in old slashings and down timber in the vicinity of their logging operations on Snake Hill, a couple of miles from the mill, got beyond the control of the men, destroyed several bunkhouses and other camp buildings, and damaged some of the equipment. The men managed to remove the two donkey engines before much injury had been done them.

## LIVES AND PROPERTY

In the Kootenay district, the most disastrous fire was near Fernie, where the Elk Lumber Co. lost a camp outfit complete, and ten of the men lost their lives. The camp was located in a blind valley, and when the fire swept up the men had to flee over the hills. Previous to that the lum-



**Improper and Proper Methods of Attaching Wire Fence to Trees.**

ber mill and camp of A. G. Lambert & Co., a Nelson concern, and the plant of the Christensen Lumber Co., both near Nelson, were burned, with a loss of about $25,000, and at Salmo the Kootenay Shingle Co. lost its whole plant and office buildings. While a large number of fires have been reported to the department from various parts of the province, the damage outside that just mentioned has not been great. The timber damage has not yet been computed.

### *Loss to Young Growth*

"The severe fires in southern British Columbia late in July destroyed large quantities of young forest growth which had established itself on lands previously burned over, in addition to considerable areas of merchantable timber," writes Mr. Clyde Leavitt in "Conservation." A portion of the young forest so destroyed was upon the area included in the great Fernie fire of 1908. Investigations made by the Commission of Conservation show that the damage done by repeated forest fires on a specific area is much greater than is generally realized. Such fires not only destroy the young growth, but the seed trees as well, thus preventing or greatly retarding the establishment of a stand of commercial species. On this account, in many sections, reproduction of valuable species is wholly inadequate, or is entirely lacking; each successive fire diminishes the earning capacity of the area, from the point of view of timber production.

During the past 50 years, forest fires in British Columbia have destroyed an amount of timber approximately twice as great as that now standing in the province, or approximately equivalent to the total stand of saw timber in the entire Dominion.

# The Case For New Brunswick's Forests

CONTINUED FROM PAGE 1339

the value of wood and its manufactures. *The share taken by the public treasury is no less than* $5,000,000 *a year.*

## WHAT THE TREE DOES FOR THE PROVINCE

One does not need, however, to cross the oceans to learn what forests accomplish for the enrichment of a people. In a twelve month the sum of $15,000,000 is distributed in New Brunswick from lumber and pulp products. Another million dollars worth of wood is used by settlers for fuel and building materials. The Government of New Brunswick gains over $500,000 a year from various Crown timber taxes to ease the burden that must otherwise be placed on the public for administration expenses. This sum will be materially increased as the result of recent re-adjustments of the dues on Crown timber. The forests of the province are producing wealth each year within about four million dollars of the whole value of agricultural production.

## ONLY UNTILLABLE SOIL IS NEEDED

The timberman asks only *non-agricultural* soil for his wood crop and every million dollars brought to the province by timber means an increased demand for everything the farmer has to sell. One cannot emphasize too strongly that more than seventy per cent. of the land area of New Brunswick will never pay a profit to the plow. From the wood crops of that seventy per cent. the province must take its chief share of future prosperity.

Contrary to a prevalent impression, forests, under modern lumbering conditions and with free access to fire, do not perpetuate themselves, except in part and that very unsatisfactorily and with extreme slowness. Nature uncontro'led is usually wasteful in her methods. Each decade has found the forest possessions of New Brunswick and other parts of Canada substantially weaker. Logged-over tracts are too often preyed upon by fire, and, even with fire kept out, the logging methods now in vogue encourage the growth of inferior species. As an illustration of this condition, white pine, the most valuable of Canadian timber trees, has been almost obliterated from New Brunswick's lumbering industry, although in the year 1825 no less than 400,000 tons of white pine were exported from New Brunswick to England. Once the standard species in New Brunswick, it represents today not more than five or six per cent. of the total lumber cut of the province. Hemlock, little valued yesterday, except for bark, now commands $8.00 to $10.00 per thousand board feet rafted at the booms. Spruce, now heading the market for saw timber and for paper making was regarded almost a weed tree within the experience of lumber operators now living, and has so advanced in value as to bring in 1917, $13.00 to $20.00 a thousand board feet wholesale, and $9.00 to $12.00 per cord F.O.B. for settlers' pulp wood. The spruce log is the standard in New Brunswick woods operations, the commercial timbers ranging in this order: Spruce, Fir, Cedar, Hemlock, Pine, Birch, Beech, Maple.

## THE NEW WORLD VALUES OF MARITIME FORESTS

Thus, within the past ten years or less a new and increased valuation has been placed by the markets of the world on the forest assets of New Brunswick. The relatively slight value of a birch stand to-day is no more a guage necessarily of what it will be to-morrow than was true of the early price of spruce and hemlock. So with every other tree species now within the provincial boundaries. The world's wood consumption is increasing enormously. The discovery of new methods of utilising what are now nearly useless woods,

is making remarkable advances, and certainly has many surprises in store. Coupled with these facts must be considered the exhaustion of cheap, accessible forests and the rapid deterioration of what were recently virgin areas of timber. The supply grows less. The demand grows greater. It is for New Brunswick, therefore, to take full toll of every square mile of her forest possessions, to realise from the markets of the world such tremendous profits as have accrued to Sweden and other European countries as well as to some of our Canadian provinces that are awake to the advantages of a great timber endowment.

Clearly, no private corporation or association of companies or individuals can undertake the task of inventorying the timber possessions of the province, and establishing a permanent policy of protection and development. That is a Government function for more reasons than one. The long-time element involved in the growing of trees is beyond the administrative reach of any but a self-perpetuated institution such as the State. The financial profits of even the wisest forest policy cannot be checked up week by week as with certain outlays for agriculture or fisheries or roads, but at the same time no resource responds more surely or generously to preservative measures than the forest.

## LOOKING INTO THE PROVINCIAL STOREHOUSE

New Brunswick has now under way the first great step in building up a permanent policy in respect to its forests. The Forest Survey and Land Classification, which now has been under way for about a year and a half, had covered by May 15, 1917, more than 550,000 acres, out of a total of 7,500,000 acres of Crown lands. Not only will the province get knowledge of the location and contents of its forest land, the amount and kind of reproduction, and rate of growth, but will be given an accurate soil map, whereby future settlement may be directed intelligently. The project will occupy several more years and is equivalent to a provincial stock-taking, a highly important element in any progressive and constructive policy.

With public opinion heartily endorsing the continuance of the Forest Survey, the next step, obviously, is to employ the information so secured in the best interests of the people of the province.

Few men acquainted with New Brunswick or Quebec or Ontario woods operations will contend that the present rate of cutting can be continued indefinitely, unless present cutting *methods* are materially changed.

What are the faults of these methods? In what way do they hamper the natural re-growth of a tract from which logs are being taken?

In practically all Government regulations covering Crown timber, certain provisions have been inserted aiming to guide the cutting so that the forest area may be kept permanently productive. One of these provisions specified that trees below a certain diameter shall not be felled, except a few for skids, or those blocking a road route. For example, the New B unswick regulations stipulate that no spruce tree shall be cut on licensed lands unless it will provide a log 12½ inches or over, stump measurement. Few will assert that this regulation in itself is sufficient or that the Provincial Government is able wi h its present machinery to give it more than formal enforcement. And yet on the *regulating* of cutting by a minimum "diameter" provision *and other safeguards*, dictated by long experience, the future security of every lumber and pulp mill and the bulk of the employment in the province rests.

If the provincial storehouse of wood materials is to be handled on the basis of permanent production, every form of needless waste must be eliminated. The cutting of stumps almost breast high cannot be condoned in these days of timber scarcity and rising values. The jobber who skims off his tract, leaving lodged trees to rot, who abandons patches of trees that are slightly inconvenient to reach, who uses good spruce logs for his roads and

skidways when inferior logs are ready to hand, who refuses to utilize as much of the top as he might properly do, is not concerned in anything more than a hand-to-mouth policy. What the *permanent* interest of New Brunswick may be, can appeal to him only by reasonable regulations rigidly enforced by Provincial officers. The Province has an interest in its forests extending generations ahead and having regard not to one class alone, but the whole people.

## A SENSIBLE CODE OF FOREST MANAGEMENT

What would be the aim of a Provincial Forest Branch of technical foresters, having authority to carry out public regulations, as they exist or may be amended?

To secure a high production of valuable material and pay to the private owner and the state the largest possible returns in the long run. As stated by Henry S. Graves, Chief of the United States Forest Service, the objects of scientific forestry are:—

"To secure quick reproduction after the removal of timber.

"To produce valuable species instead of those having little or no market value.

"To secure a full stock in contrast to those of small yield.

"To produce trees of good form and quality.

"To accomplish the most rapid growth compatible with a full stand and good quality."

—a code of business-like objects, the gradual adoption of which in New Brunswick will arrest the impoverishing tendencies of present-day woods methods, and develop rather than undermine the mainstay of prosperity.

## WHAT MAKES A LIMIT VALUABLE?

Unlike some jobbers, who have no permanent investment in a forest tract, and have no industries dependent upon a source of accessible supplies, the licensee himself will, in most cases, heartily support whatever means will keep his limits in continuously productive condition. His interests are industrial. The speculative era in timber has passed. His mills must be fed with logs or go bankrupt. To him the value of the limits lies not altogether in their present cubic contents of timber, but also in *their ability to repeat their crops.* In that last phrase lies the crux of the argument for a more determined and intelligent public supervision of cutting operations. *Timber crops are not repeated*, except at a heavy discount and very slowly, as cutting methods now are allowed to exist. The operator, therefore, is in a position where only the rising market value of Spruce enables him to count his limit at a higher price, for the quantity of timber on cut-over tracts at each successive culling grows actually less, and the interval of delay grows longer; growth in the forest is slower than many believe.

Because one lumber firm has been able to take off successively from one district, profitable quantities of timber and pulpwood during a period of, say, sixty years, does not necessarily signify that it is reaping *only the increment* of forest growth. Usually the history of a New Brunswick limit is in some such sequence as this:—

The limit was worked for the choicest pine.

Then came a second and third culling of pine, a more complete and drastic operation, leaving relatively little of that species.

Next, the operator took out the largest spruce of saw timber size. At each return he cut what previously would have been passed over. With the biggest stuff already marketed he proceeded to shave the diameter limit closer. Finally the market for pulpwood made it worth while to take out spruce and balsam down to the smallest legal diameter. Obviously the timber limit was producing for the market more than its natural increment. It was giving not alone the increment, but much of the capital stock as well; in the case of pine, the larger part of the capital has gone. As time passed,

logs in the driving streams appeared smaller and smaller. The capacity of that area for periodical production had seriously declined.

A notable consequence of severe culling of coniferous species has been to encourage the growth of hardwoods. The transition has been a money-loser from every standpoint. The great woods of commercial demand are coniferous—spruce, pine, hemlock, etc., and the great lumbering and pulp making industries of the province of New Brunswick cannot be maintained on other than coniferous forests.

## GETTING RID OF THE FIRE PLAGUE

Under the proposed New Brunswick Forest Service should come the control of the fire ranging force.

Until fire is eliminated, "Conservation of the forests" can make no real headway. One may as well attempt efficiency by painting the lifeboats of a ship and building watertight bulkheads while the hull itself is perforated with decay.

The Director of the Forest Survey has stated that of the 550,000 acres examined, 82,270 acres have been burned by fires of fairly recent date. Had this area not been burned over, there would have been, besides the amount already taken out from time to time, merchantable timber standing on those tracts to-day worth at least $714,000. This figure applies to only one-thir teenth of the whole area to be examined.

## CLOSING OUT A COSTLY RECORD

Let us consider not the question of culpability for losses sustained in the past, but rather how New Brunswick can bring that record to a close.

The success of any fire protection arrangement rests, first, upon organization. New Brunswick's laws provide for the appointment of a Chief Fire Warden. Under him are fifteen county wardens who have a varying number of deputies. In some counties the deputies are paid a fixed sum annually, and in others they are remunerated on the per diem basis.

By this system, 160 men, on an average, are on the Government pay roll as permanent wardens. They look after fire protection and game during the spring and summer, and game protection during the fall and winter.

The fire wardens, responsible for timber guarding, receive remuneration varying in amount and form of payment from $2.00 a day to $250.00 a year, a few at $300.00, with some county wardens receiving up to $900.00 a year. The average amount received last year per man was about $52.00. For such pay no body of men can be expected to render more than intermittent service or to undertake arduous patrol, or to go far afield in search of fires. British Columbia this year, is paying its forest rangers $100.00 a month for a six months' period, for which the Government demands and secures an equivalent in energetic application to duty. Ontario pays its forest rangers (under its recently re-organized system) $75.00 a month minimum. Quebec pay averaging $60.00 a month. Cheaply-paid forest guards usually represent unenthusiastic service. They are available for action usually only when fires have secured headway. Neither is it their hourly duty to look after fire *prevention* and public education, such as applies to a truly efficient ranger working under an up-to-date system. Adequate wages and alert inspection always recoup the public treasury well during a season of average fire danger. One might hazard a guess, without being accused of exaggeration, that for every dollar withheld from the forest protection service, short of a really adequate amount, the people of New Brunswick are losing many hundred per cent per annum in forest fire damage.

## HOW A BETTER SYSTEM CAN BE PAID FOR

The proposed reorganization of the fire guarding scheme involves no *net* outlay on the part of either Government or licensees, and would quickly put an end to a destructive agency that is penalizing the people of the province.

The Canadian Forestry Association leaves to the judgment of the Government and its staff of foresters the detailed plan upon which a reorganization could be based.

It may be that the Government will consider the taxing of licensed lands at a half-cent an acre, somewhat similar to the method of Ontario, where the tax is double that amount, or of British Columbia where the fire tax is one-and-a-half cents an acre, the British Columbia Government contributing dollar for dollar. This would give the province $40,000 which with the $60,000 now spent on scaling, fire protection and administration of fish and game laws would make an annual fund of $100,000 sufficient to construct a forest service second to none in Canada.

The mere heaping up of a fund of $100,000 would not in itself correct the inadequacies of the present forest protective work. From the Parliament Buildings at Fredericton, out to the most distant ranger in the field, there must be a plan of co-ordination and co-operation. This pre-supposes an efficient head-office staff, directed by the Chief of the Forestry Division. To this officer should be delegated control of practically all the public forest administration, the appointment of a sufficient number of inspectors to get good service from the field employees, the allocation of rangers and the enforcement of discipline.

## NEW BRUNSWICK'S PROBLEMS SOLVED ELSEWHERE

The appointment of a Chief Forester, with power and sufficient money to reorganize the protective service, would in itself relieve the government and the people of the need for protracted debate and investigation. Methods of fire protection have become in a general way standardized the world over. Other parts of Canada have built up forest guarding systems that completely outstrip in actual results the methods that preceded them. New Brunswick offers few special difficulties that have not been already surmounted in Quebec and British Columbia and in many of the states of the American Union.

Under skilled direction, a reorganized forest department would bring into effect the system of issuing "permits" for all settlers' land-clearing fires. It would introduce modern aids such as telephone lines, lookout towers, the cutting of trails and roads and other facilities for quick communication. An ounce of prevention is worth at housand pounds of cure in forest fire work, and *speed* is the essence of prevention. Speed in the detection of fires, in their incipient stage, speed in calling help, speed in reaching the scene of danger. At one time in 1916 sixty fires burned simultaneously on the areas of one of the well-organized Quebec forest protective associations. But every fire of the sixty had been promptly seen by rangers on patrol or from lookout towers, and, by using the telephones, men were rushed to all centres of trouble. Every fire was extinguished. Not one was allowed to grow big and get beyond human control. Prompt detection usually means prompt extinction. But detection requires the afore-mentioned mechanical aids, without which the best human labor is heavily handicapped.

## THE ADVANTAGES OF CENTRALIZED AUTHORITY

The advantages of combining under a single department of the Government the work of supervising cutting operations, fire ranging and timber scaling are very clear. The three sets of duties have to do with Government responsibilities over Crown forests. The ranger would find occupation during the time of fire hazard, roughly from April 15th to October 15th. He could then be transferred to timber scaling or utilized in various field undertakings of the Forest Branch. Control of cutting would, of course, require several technical men, whose services could be utilized also for forest surveys, mapping, land classification, construction of fire protection trails, telephones, etc. This would mean continuous year-round employment for the main body of employees, with the prospect of promotion as they became more efficient. In any line of work transient jobs do not attract the best class of men and this is markedly true of forestry employment.

# Schoolground Planting Left to Chance

### *In Nova Scotia*

By L. A. Dewolfe, director rural science schools

The question of a nursery to supply shrubs and other plants for school grounds is worth pushing. Thus far in Nova Scotia we have none. The Agricultural College grows a considerable quantity of shrubbery for its own use; but it has not given any to schools. There is not sufficient ground under control of the Education Department to grow material for distribution. Our Normal College has less than two acres of ground, with no chance to enlarge its area.

From the other provinces we hope to learn some method of supplying our schools with desirable material without having to buy it from private nurserymen.

### *In Manitoba*

By B. J. Hales, B.A., Ll.B., principal of normal school, brandon

For some years past there has been some distribution of nursery stock by the province, but it was largely material received from the forestry nurseries at Indian Head or from other sources. For the last year or two we have supplied a part of it. In connection with our forestry instruction in the Normal School, we have found it necessary to grow a considerable number of trees and shrubs, while in our horticulture we have found it necessary to grow quantities of herbaceous perennials. This year it was decided that all the distribution should be from the Normal School, and that it should be confined to material of our own growth. As part of the old arrangement I received a shipment of seedlings from Indian Head, but they were not distributed this year. We planted them in our own nurseries and will have them for future distribution.

### *In Ontario*

By J. B. Dandeno, Ph.D., inspector of elementary agricultural classes

There is no special provision made in Ontario to supply nursery stock of forest trees or shrubs for the ornamentation of school grounds. Where school boards are desirous of obtaining such material, they are expected to secure it either from nearby woods or swamps, or from regular nurseries. Where the schools are maintaining classes in agriculture, a portion of the grants apportioned to the board for equipment may be used to purchase trees, shrubs, or perennials. In schools where agriculture is not taught (the subject is optional) according to the prescribed regulations of the Department of Education, no financial assistance is received for this purpose.

## THE FARMER AND HIS PULP WOOD.

In many parts of Canada there is a close connection between the pulpwood market and the prosperity of the farmer. Proper handling of his forest might make it a continual source of income. The wanton burning of any timber to destroy it should be made a crime. It is less likely to be burned if the farmer understands how to make money from it. Intelligence is better protection than punishment.

Attention to forestry matters is important, both to the welfare of the farmer and the future of the Canadian forest resourses and industries dependent on them.

Co-operation between forestry and agricultural departments in this regard would be an advantage.

"*From Pulp and Paper Magazine*"

## THE RIGHT LOG LENGTH TO PREVENT WASTE

By R. O. Sweezey,

The point to observe about 16 ft. logs is that spruce will cut one to four logs per tree. In black spruce we usually get two or three logs in the mature trees, and where two logs are cut, probably over 50 per cent. of such trees would yield an additional 8 to 12 ft. down to 4 in. top; but, as the operating company wants only 16 ft. logs, the lumberjack has no choice but to leave the top to rot in the woods. The difficulty lies in the fact that the logs are too long. Multiples of 12 ft., say, would give three logs, equal to 36 ft., where only two 16 ft. logs can be cut. It is obvious that both in theory and practice the shorter the log the more complete will be the utilization of the tree.

Now, in the Province of Quebec (which boasts the best log-makers in the world), where streams are so plentiful that long hauling is rare, logging is done mostly by the single-horse method. One immediate result is that roads cost much less, and with small horses the jobber gets into corners where pulp logging by the Ontario system would be very costly. By reason of this single-horse system and narrow roads (aptly described by an Ontario operator as "cow-paths,") the jobber, equipped with his home-made sleighs of peculiar design, can and does make more logs and greater quantity in a given time than the Ontario log-maker.. But he prefers the shorter logs; 9 to 12 ft. suit him best, because one man alone can handle these better than he can the 16 ft. logs, for which, if he must make them, he demands 50 cents a cord more. Thus the extra cutting necessary in logging the shorter lengths is more than offset in the handling. The question, then, is why should not all Ontario pulpwood operators adopt the shorter lengths and save the waste now occurring in tree-tops?

## NEW STUMPAGE LAW IN N.B.

An act to falicitate the collection of stumpage, which is of special interest to the lumber, pulp wood for paper industries, has been agree on in the New Brunswick Parliament. The new measure provides:

All licensees of crown landn in the Province shall annually, not later than the first day of October in each year, furnish the Minister of Lands and Mines with a sworn statement of all operations upon timber berths held by such licensees, stating the quantity, number, and superficial contents and kinds of logs, lumber, or other timber cut or made, upon each of such timber berths during the 12 months previous to the first day of May in each year, and also the quantity cut or made upon granted lands during the same 12 months.

All licensees exporting pulp wood, rossed or otherwise, shall furnish a sworn statement to the Minister of Lands and Mines at the close of the shipping season showing the number of cords shipped.

Should any licensee fail to comply with the provisions of this act, or should the statement furnished be found to be willfully inaccurate, the licensee furnishing the same shall forfeit all right to his license, and the berths and limits shall become vacant.

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The Canadian farmer, in so many districts, receives part of his income from his wood lot or must clear his land before planting, that departments of agriculture should pay considerable attention to the forestry side of the farmer's education. The opportunity seems to lie in three channels, the agricultural bulletin and country paper, the district representative and his local organizations or clubs, and the agricultural college.

A comparatively small amount of instruction and demonstration should be of very considerable value to the young farmer.

## CANADIAN WOOD IN FRANCE.

(*From Report of Dominions Royal Commission*)

"Very little Canadian wood is sold on the French market because it is almost unknown, and, what is worse, in the few places where it is known it has the reputation of being of very inferior quality. This seems hard to believe, but it is only the strict truth. It can be explained by the fact that the Canadian lumber exported has been sent almost exclusively to Great Britain and when, from time to time, it was sent from that country to France, it lost its name and passed as the product of other countries. This was the case with our fine woods that brought high prices. It must be admitted, however, that certain shipments of Canadian wood of a most inferior quality were unloaded on the French market at low prices because they could not be disposed of elsewhere. Such proceedings have caused incalculable harm to the reputation of our products. Unfortunately, our exports of high quality lumber have not been able to counteract this undesirable reputation, since they have always been credited to other countries. At Contras, near Bordeaux, the following sign is displayed on a large lumber factory: "Bois de l'Amerique du Nord" (North American Wood). It is evident that in France, Canada does not exist as a separate country, only "American" products are known."

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## OUT FISHIN'

A feller isn't thinkin' mean,
Out fishin';
His thoughts are mostly good and clean
Out fishin';
He doesn't knock his fellow men,
Or harbor any grudges then,
A feller's at his finest, when
Out fishin'.

The rich are comrades to the poor
Out fishin';
All brothers of a common lure,
Out fishin';
The urchin with the pin and string
Can chin with millionaire and king,
Vain pride is a forgotten thing
Out fishin'.

A feller gets a chance to dream,
Out fishin';
He learns the beauties of a stream
Out fishin';
And he can wash his soul in air,
That isn't foul with selfish care,
An' relish plain and simple fare
Out fishin'.

A view of British Columbia Tree Nursery for the Improvement of School Grounds.

Bamboo belongs to the grass family, although its tall stalks resemble saplings. As material for rafts, fishing poles and even for houses it has been in use since the world was young. Orientals consider the young shoots, which resemble asparagus, a nutritious food.

The banyan tree, on account of its habit of putting forth numberless trunks to support its branches, is regarded as a robber. But it yields rubber equal to Para.

Although the spongy wood of the silk-cotton tree, found principally in Jamaica, West Indies, is too light to be of commercial value, the natives make canoes out of it and fill cushions and pillows with its long silky threads. Its root-formations make the tree earthquake proof.

# Best Methods of Burning Brush

By Henry S. Graves

*Forester, U. S. Departmeut of Agriculture.*

An excellent time for burning brush is after the first snow of winter. This is usually a light fall, and the snow does not penetrate the compact piles of brush sufficiently to prevent burning. There is no danger of the fire running on the ground, and the branches of the standing trees are so damp as to prevent injury by the rising flames. If the brush is burned before winter, it should be only during damp weather, when the ground is so wet that fire will not run easily.

When large areas of piled brush are to be burned the work should be organized with care. It should never be undertaken when there is a strong wind, and the best time is in calm weather. If there is any wind, the burning should begin with the piles on the lee side. Several piles may be fired at one time, but they should be some distance apart, with one or more unburnt piles between them. When the first fires have been burned down to coals, the intermediate piles may be ignited. This alternating method of burning the piles prevents the injury to trees and young growth between the piles that might result from the collective volume of heat of adjacent fires. Just as the brush on level ground is burned against the wind, so, on a hillside, the piles near the top are burned first, and the work progresses down the slope.

*Controlling the Fires*

Whenever large areas of piled brush are to be burned, a sufficient force of men, equipped with fire fighting implements, should always be present to insure that the fire will not get beyond control. In some instances, when brush is piled in the winter during logging and left for later burning, the piles become very wet from the snow and rain and do not dry out till late spring or summer, a time when burning on a large scale is dangerous. If the brush of winter lumbering can not be burned as the logging proceeds, the piles must ordinarily remain unburned till the first snow of the following winter, or till especially wet weather comes in late summer or fall.

The devices used in different localities for starting fires in piled brush are many. Some loggers use a torch of burning wood, as resinous pine; others carry live coals from one pile to another; others use a long-handled torch; others, again, pour a little oil on the brush and start it with a match. The most satisfactory seems to be an ordinary tubular torch with wicking and a ferrule into which a rake handle can be inserted. A good substitute, though a crude one, for the last is a piece of bagging or burlap wound around an iron rod or stick of wood and occasionally saturated with oil.

*Cost of Burning*

The cost of burning piled brush in the coniferous forests may vary from one to thirty cents per thousand, according to the manner in which the brush is piled, the condition of the brush, the size of the crew needed to prevent the running of fire, etc. Commonly, it ranges from five to fifteen cents per thousand feet. Where the cost has been higher than this, it has been attributed either to poor work in piling or to inefficient management in the work of burning. The average cost of both piling and burning should range in coniferous forests between ten and fifty cents, and as the lumbermen become more experienced in performing the work the cost will be correspondingly reduced.

In some coniferous forests careful records were kept of the area actually burned over. Where the stand per acre ran from 10,000 to 50,000 feet per acre, the aggregate area burned over by the brush fires was found to be approximately seven per cent. of

the total area cut over in the logging operations. Where the brush is burned as the logging proceeds, the percentage of the area burned over is less.—*Reprinted from American Forestry.*

# *German Prisoners in a Lumber Camp*

Canadian Front in France.—"Eyes lefdt" 'Eyes frondt" Uttered in gutteral German, these commands sound strangely on a Canadian ear. Stranger still is the mis-en-scene whence they arise. For the non-com. who shouts the order is a hulking Hun in field grey, wearing the Iron Cross, and by his side marches a column of German soldiers. But no Mausers are in their hands, no bayonets at their sides, and the headgear is not that of one regiment.

Blue, red, yellow, white, border the caps of these men, and quite as diverse are the designs of their shoulder straps. Tall and short, fat and thin, many be-spectacled, mingle in this conglomeration of Prussians, Bavarians, Saxons, Wurtemburgers—no longer soldiers, but woodmen marching to dinner. They salute a group of Canadian officers as they pass, and the bully German non-com. in charge is quite evidently glad of a chance to air his authority a bit in public and do a bit of the swanking he was wont to do in the barrack square of Deutschland.

### *Felling a Jack Pine*

It is in a pine forest of France that your correspondent saw these Boches working for the Canadians engaged in forestry work. Working, did I say? Well, imagine thirty-two husky Huns pretending to haul on a rope, leisurely pulling down a tiny jack pine, scarcely more than a sapling, and you can visualize their efforts. How an Ontario farmer would laugh at such "work." However, the Germans do accomplish a little. They quite evidently like this "job," and it confers an appetite and an appreciation of the comfortable huts in which they are housed.

By the roadside stands their own German "koch," and facing him a row of burnished kettles. Brimming with some savory stew, the steam ascends in fragrant clouds. To him in batches of twenty at a time come the prisoners, to fill their dixies and receive each one a generous chunk of bread. Squatting under the trees in this fine weather, they partake of their mid-day meal. Would that Canadians in Bocheland fared half so well. After feeding, several of the Huns produce long-stemmed pipes with china bowls, which they puff contentedly, their enjoyment unimpaired by any thought of the sentries who stand back among the trees in case some forgetful Hun might wander through the sylvan dells.

### *A Fairy-tale Wood*

And what a pine forest is this! Its like does not exist throughout the length and breadth of Canada. A regular fairy-tale wood, this vast plantation of clean trunks, rising almost limbless to an average of fifty feet, green-topped, springing from an underbrushless carpet of moss and needles. They grow in yellow sand, these trees. The larger ones measure from 10 to 14 inches through at the base, and give some 40 feet of log.

Hark, Canadian lumbermen. In this country a stern government allows no timber-limit vandalism on the part of loggers. No brush nor slashing may be scattered about as in Canada, to start fires. Everything here is piled, swept clean. In the adjoining French section of this wood I actually saw windrows made of branches carefully tied together. Thus they are shipped off to Paris for firewood.

### *How French Fall a Tree*

In marked contrast to the Huns are the Canadian bushmen, who, overalled, stand in military formation ere

they dismiss to lunch. A little group, they have charge of the more technical jobs. Soon a mill will hum in this vicinity, as others are doing elsewhere, turning out its full quota each day. These Canadian mills are not only supplying our own troops, but Imperial and French troops as well.

Canadians are hard at work in forests of beech, hornbeam, ash, oak, birch, cherry and chestnut trees, which are falling before them, and, oddest sight of all, are being pulled down by block and tackle. Such is the French fashion. Limbs chopped off, and a rope attached to its top, many a tree is torn out by the roots, which are afterwards sawn off. Queer lumbering perhaps, but it saves the older trees.

Picture a quaint village, mediaeval church, fifteenth century houses, an inn, from whose timbered doorway d'Artagnan might well sally forth at any moment. Picture an emparked chateau which escaped the revolution, whose pillared gateway was old when Marie Antoinette came joyfully to France. 'Mid such surroundings, among trees where the deer fed undisturbed, now rises a cloud of smoke, beneath which, entrenched among the new, white timbers of a brand new mill, a whirling fiend devours the woods.

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## H. R. MacMILLAN RESIGNED

H. R. MacMillan, formerly Chief Forester of British Columbia and Timber Trade Commissioner for Canada, has resigned his position as assistant manager of the Victoria Lumber and Manufacturing Company at Chemainus, B.C.

At the request of the Imperial Munitions Board Mr. MacMillan has undertaken to locate the stands of British Columbia spruce adapted to aeroplane manufacture, and on this most important task he will be engaged for the remainder of the war.

## WHAT DO YOU KNOW ABOUT OUR WILD ANIMALS?

The Canadian Forestry Journal is able to offer its readers an opportunity to secure a most interesting "Animal Book". The illustration as above, represents the paper-bound edition which sells on the bookstands at one dollar. The Journal has arranged for a limited edition of **leather-bound** copies to sell at the same price, one dollar.

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# Early Days in the Lumber Camps

*By Capt. Robert Dollar*

*Ed. Note*:—Captain Robert Dollar began life as a camp boy on the Upper Ottawa in the employ of Mr. Hiram Robinson of Ottawa, a Director of the Canadian Forestry Association. He rose to a commanding position as a lumber exporter and ship owner.

In passing through Western Ontario in a comfortable Pullman with dining car attached and in crossing to Spanish and Serpent Rivers, it brought back very vividly to my recollection the tremendous changes that have taken place in this part of the country in the last 35 years when there was hardly a white man on the shore of Lake Huron at Killarney and Spanish River Mills.

At this time I was lumbering on the Serpent River some 30 miles from Lake Huron. We sent in the men and supplies in a steamer in the fall of 1881 and built a warehouse at the mouth of the river to hold our year's supplies. We boated supplies up the river to where the camp was to be built, sufficient to last until the snow and ice made it possible to haul with teams. The men were then cut off from all communication with the outer world. On February 21, 1882, I started with a team of horses to visit the camp. The entire distance of 250 miles was made on the trackless ice from Parry Sound, Ont. The time occupied was eight days. We slept out every night. The weather was intensely cold, being below zero the first three days, while on the last day it rained. Not being prepared for such a change in the weather, we had a miserable time of it. Sleeping out in winter in a heavy rain storm is anything but comfortable to say the least.

*A 35-Mile Tramp.*

The weather was so bad, I left the team and teamster at our warehouse at the mouth of the river and made the last thirty-five miles on foot in the soft, slushy snow. It was hard walking and I was glad to get to the camp, and the men were delighted to get news from the outside world. I found the work had gone on successfully, and we had a lot of fine timber on the ice ready to be floated to Lake Huron, where it was to be loaded on vessels and taken to Kingston at the foot of Lake Ontario. There it was rafted and run down the rapids of the St. Lawrence, then towed to Quebec to be again loaded into ocean going ships for Liverpool where it was again formed into small rafts and taken up the canal to Manchester. Here it was sawn up into sizes for making cotton spinning machinery.

I spent three weeks looking over various tracts of timber, but could not find the sized timber required for this trade, namely, 20 inches average diameter. On this account I decided

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to shift my operations to Michigan, where the desired size of trees could be secured. It had got very near the breaking up of winter, and we had 12 more men than was necessary to drive the timber down the river, so I started out with a team of horses and the 12 men, intending to return as I came, on the ice along Lake Huron and the Georgian Bay to Midland. But the fates decreed otherwise. The first night we got with considerable difficulty to Little Current on Manitoulain Island on account of the ice having melted in the recent spring weather. I found it impossible to go further with the team and decided to send it back to the camp, and tried to induce the men to return, as I could see we were in for a 250 mile walk. Besides there was the uncertainty of the ice not remaining long enough to make the trip. They decided that if I could do it they could. I tried to explain to them that it was a case of "have to" with me, but they could return and work in the camp until navigation opened. I had various camps in Muskoka and Parry Sound district, so that it was necessary for me to be on hand to arrange about getting the logs driven when the water was high. All of no avail. The men were determined to get out to civilization.

*Primitive Travel.*

I bought a few hand sleighs and put on them what was actually required for the trip. We started out, pulling the sleds on the ice. The third day out a severe snow storm was raging, and it was impossible to travel, so we had to lay up all day much against our will. I found we barely had provisions enough to take us to Byng Inlet, so I had given up the idea of going to Midland, as the former place was much nearer.

Next morning we were up before daylight ready to start, when we discovered the ice had gone out during the storm. There we were on the bleak and barren shore of Georgian Bay and had now to "foot it" through the trackless forest. We reached French River which we had hoped to cross on the ice, but to our dismay it was wide open, the ice having gone out with the previous storm. So we had to cut logs and pull them to the water and make a raft of them. This took an entire day and was attended with much hunger. The first raft capsized and two of our men narrowly escaped perishing in the cold water. We then cut larger logs and made a stronger raft. Our tools consisted of one axe. We secured the logs with twisted withes. We all got across alive, and to our delight we found the ice was still fast inside of the islands, and we were enabled to make much better time.

*Dividing the Flour.*

I found our provisions were about exhausted, so I had all the flour baked into cakes and divided equally. It was just enough for a small meal. I told the men that the nearest civilization was three days journey and that each one should divide his cake into three pieces but nearly all ate them at once. I divided mine into three days' portion. Each piece was about one inch square. The ice was getting bad and several of us went through it. I kept on the lead and got more wetting than the rest. The nights were very cold; we suffered a good deal, wet in the afternoon and freezing at night. The frost hardened the crust, so in the forenoon we had fairly good walking, but afternoon every footstep went through the snow and into the water on top of the ice. I remember I had deer skin moccasins on which kept the water out as well as a pair of socks would.

The men got tired out and it was only by encouraging and urging them on that we were able to make any headway, for many of them wanted to lay down and give it up.

The last day before arriving at Byng Inlet I told them I would go on ahead and get provisions sent back to them with Indians and for them to follow my tracks, but before noon I came across an Indian wigwam. A squaw and two children were the occupants. She could not talk English or French, so I made

signs to her that I was hungry, and tried to make her understand there were twelve more coming. I found she had about 20 pounds of flour, but no meat of any kind, so she started in to make "slap jacks." I did not eat and encouraged her to make more until about three miles off our men were in sight. I took her out and showed her the crowd, and she held up her hands in despair. I put aside enough for herself and children for one day and made her understand I would send her plenty the following day, so she went to work and baked the balance of the flour. To my surprise she went out into the snow and dug up a white fish three feet long and put it into a pot of boiling water, scales, insides and all. This was as sweet a fish as I ever tasted.

In the meantime, I saw the very slow progress of the men. I got some birch bark and made a big smoke. The effect was magical and I could see them immediately begin to step out. When they came they ate everything in sight and I had a hard time to pre-


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vent them from leaving the squaw without any food. I almost had to use force to get them to start out for Byng Inlet. Ten miles distant we found a trail which helped us out and reached the mill at ten at night where we got plenty to eat and washed our hands and faces. The first time in two weeks. We were more like negroes than white men.

A few days before it looked like a physical impossibility to come out of our trials alive. I sent an Indian back to the squaw with four times as much flour as we used. I left our men here to rest up three or four days before proceeding.

*Starting the Drive.*

I was up bright and early next morning, as I knew I was urgently required to start the drives. I had a camp at Shawinager and started out on snow shoes that I borrowed. The distance from Byng Inlet to Shawinager through the woods was 45 miles, with no road or trail. At dark I was able to strike an unused government road which led to our camp, which I reached after everyone was in bed. I looked over this timber and works in the forenoon, (we were getting out what was called Tonawanda timber, which was got out the full length of the tree; in the summer I towed this across Lake Huron to Detroit), and took one of the teams to carry me to Rosseau, which I reached after midnight.

The winter roads had broken up and I could not get anyone for love or money to take me to Bracebridge, Muskoka district, my objective point, so I started out on foot again for a 35 mile tramp. I remember the mud was ankle deep in places and with dirty clothes and deer skin moccasins, I certainly was a "tough" looking tramp. Next morning I was busy hiring men for the drives for the various camps, apparently none the worse after about as hard an experience as few lumbermen, even in those rigorous days ever had.

## EAST VALUES B. C. WOOD

1916 witnessed a remarkable increase in consumption of B.C. lumber in eastern Canada, the quantity sold in the east in 1916 being almost double that of previous years—a most satisfactory showing in a competitive market such as this where native and imported woods are readily available.

Energetic educational work has been carried on by the B.C. Forest Branch in Eastern Canada for the past 18 months, resulting in a wider knowledge and appreciation of the excellencies of British Columbia woods and a better understanding by our mills of the requirements of the eastern market. This market should show substantial increases from year to year and be of great value to our industry. With the return of normal shipping conditions it is hoped to establish a cargo trade from British Columbia to eastern Canadian ports via the Panama Canal.

—*B. C. Official Report.*

## TROOPS USED IN FOREST FIRES

The forest fire situation became very acute in August and early in September, due to the fact that there had not been any rain for nearly seventy days in the western part of Oregon and Washington. Forest fires were becoming alarmingly prevalent. In Columbia county, as an example, experienced state fire wardens soon became aware of the fact that the men whom they were receiving from the Portland employment offices were in themselves a menace and were actually setting fires. Incendiarism was becoming rife.

Upon application to Governor Withycombe of Oregon, Colonel C. E. Dentler, commander of the Northwest department of the United States Army, was appealed to and under the direction of Hugh Henry, manager of the Oregon Forest Fire Association, small bodies of cavalry and motor patrolmen were distributed throughout the forest regions of Oregon. The results were very gratifying. Not only was incendiarism brought to an abrupt close but in one or more instances the soldiers actually assisted in the putting out of the fires.

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## TOY MAKERS USE PLANING MILL WASTE

That a market for virtually all of the waste of a planing mill is to be had for the seeking is evidenced in the occasional bringing to light of what is being done by some planing mill managers in various sections of the country. The latest has to do with a planing mill in the Northern States. In turning out some of its products waste blocks of various sizes were numerous and served to furnish all the fuel required for the plant. This material had a fuel value of $3 a ton.

One day a visitor looked the plant over, noted the waste blocks and began to figure out the number of them in a ton. He offered the manager $17 a ton for all the waste of that character turned out. A contract was made and the visitor informed the manager he was a toy manufacturer and that the blocks purchased would cost him less than half of what it cost him to make them. The mill manager immediately placed his thinking cap in order, secured samples of all the planing mill waste, called on other toy manufacturers and before returning home found a market for all the waste about the plant except the sawdust. The final result is that the sale of the waste purchases all the coal needed for the plant and leaves a profit averaging $300 a month to the company.

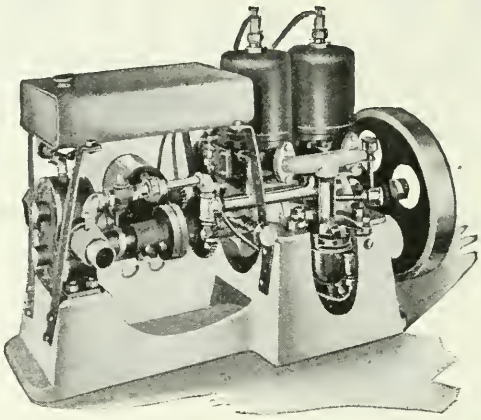
A little analysis of the waste products about the saw and planing mills would soon prove that much of the material going to the slab pit has an excellent commercial value.

## PROFIT IN TREE GROWING

"The growing of timber can be made a commercial success. In 16 years mine props and fence posts can be harvested. In 26 to 36 years timber large enough to produce paper bolts can be grown. It will thus be seen that large corporations which make paper, for instance, can be induced to reforest large areas and thus insure an adequate supply of pulp paper for their future needs. The value of the wood will justify the carrying charges."—*Dean Baker, New York State, College of Forestry.*

## FORESTS SELF-SUSTAINING

The report of the United States Forest Service for the fiscal year ending June 30 last, will show that the national forests are now almost self-sustaining. Receipts during the last fiscal year aggregated about $3,450,000, mostly from timber sales and permits for grazing, water power development and other purposes. compared with a total cost of operating the national forests of about $4,000,000. Those in touch with the situation predict that during the current fiscal year the national forests will probably pay all expenses from the proceeds of their operation.



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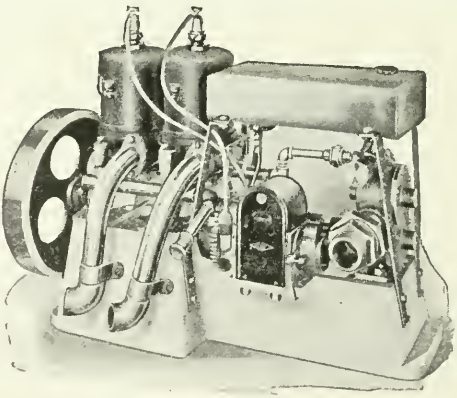

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# *Gifts of Trees to Northern France*

(*Editorial from the Philadelphia Bulletin.*)

It is interesting that the nurserymen of the country, assembled here in convention, are considering the proposal of reforesting Northern France at their own expense. This is the plan of Prince Poniatowski, a name familiar to all students of Napoleonic literature, and while our nurserymen cannot do all of the replanting of fruit and shade trees which the Boches have destroyed, they seem willing to do their share and to make it easy for other philanthropists to co-operate.

It is well known that as the Germans have been driven back from their original line they have left only a desert behind them. Everything has been destroyed except the soil, and that has been so badly cut up that it will be long ere it produces its normal yield. The annual crops are to be restored much sooner than the vineyards, orchards and shade trees. It will be remembered that Professor Ferrero tells in one of his histories that in a single year Spartacus and his revolting gladiators did more damage to Italy than Hannibal did in seventeen. This was because the latter destroyed simply the annual crops, which meant the loss of only a year's income, but by the time of Spartacus the olive and the vine had replaced grain in Italy, and it took years to replace them.

This is the case with Northern France. It needs fruit trees and vines to replace those which were destroyed, and several years will be necessary to restore former conditions. It may be that the nurserymen will

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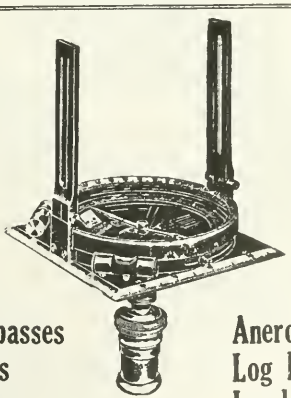

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start a propaganda among the children. It would be easy for any child to save enough to buy a peach or apple-tree cutting, to purchase a vine or even a young maple. Northern France is about as bare as the sands of the seashore, and here is an excellent chance to do some constructive work which will cost individuals little but will amount to much in the aggregate.

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### FRANCE'S FOREST INCOME

The gross annual income of the state owned forests of France prior to the war is said to have been $6,000,000, or $2.72 per acre of producing forest. The total expenditure amounted to $2,725,000, or 70 cents per acre. Therefore prior to the great war the annual net forest income amounted to $2.02 per acre.

Raphael Zon, chief of sylvics, U. S. Forest Service, tells us that the forest area of France contains 20 per cent. conifers and 80 per cent. hardwoods (35 per cent. of this being ordinary oak and 1 per cent. stone oak).


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## BEARS INTERFERE WITH FORESTERS

As an interesting example of the problems which a forester has to work out, it is said that forest officials in India have undertaken to girdle undesirable trees in order to kill them off and give more room to the Deodar and other valuable species. Himalayan bears, however, have discovered that the sap from these girdled trees is sweet and toothsome and have undertaken some girdling on their own hook. They have caused a good deal of trouble because they do not confine their operations to undesirable trees.

## NEW YORK TO GROW CHRISTMAS TREES

The state of New York buys annually about a million and a quarter dollars' worth of Christmas trees. It is the intention to plant and grow a large proportion of the Christmas trees on the state forest lands and keep this large sum at home instead of sending it to other states.

The state of New York is farming only 15 million acres out of the 32 million located within its boundaries.

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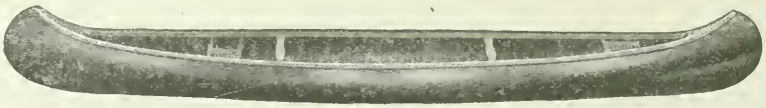

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# Canadian Forestry Journal

Vol. XIII. NOVEMBER, 1917 No. 11

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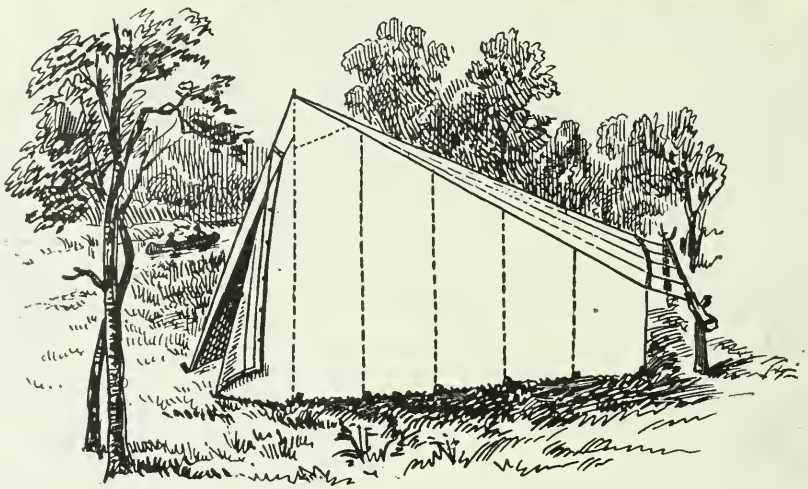

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# Canadian Forestry Journal

Vol. XIII. WOODSTOCK, ONT., NOVEMBER, 1917 No. 11

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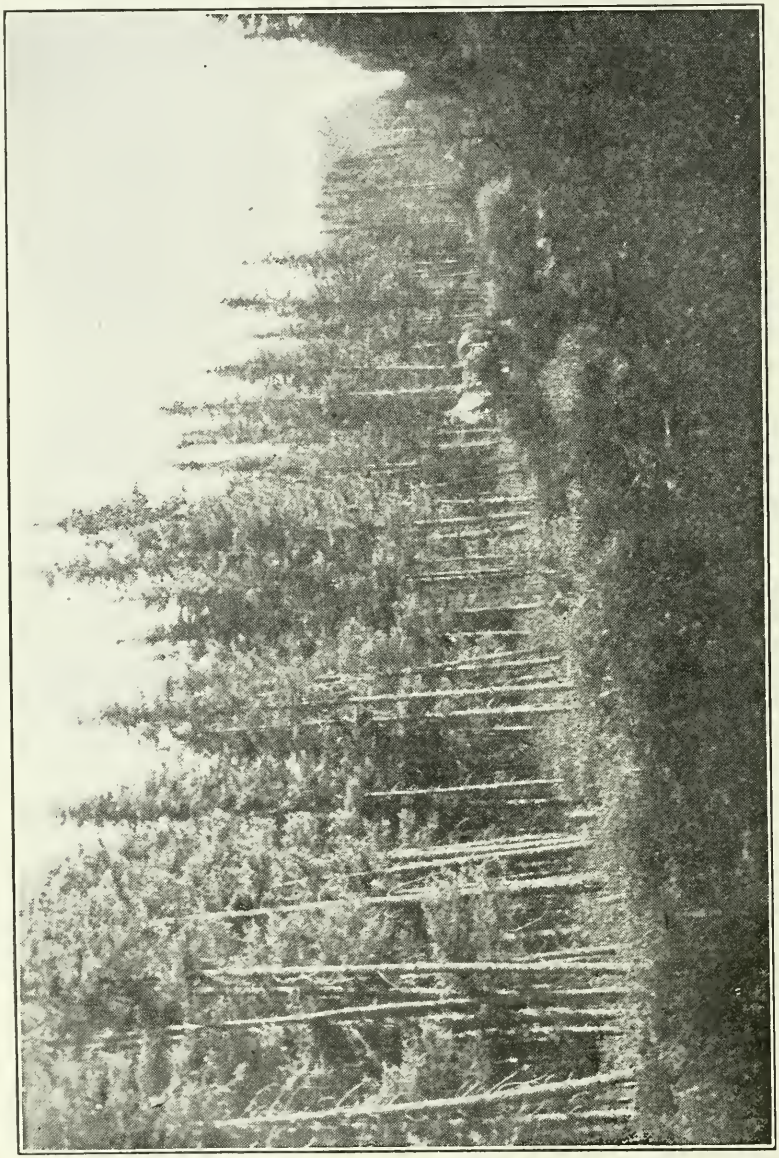

**Dense Stand of Black Spruce, Muskeg, Riding Mountain Forest Reserve, Manitoba, Sixty Years Old**

# A Victory Over "Patronage"

## Important Work of Western Forest Protection and Development Freed From Political Millstones.

The ousting of "patronage" from its long-entrenched position as dictator of Federal Government purchases and appointments may be accepted as one of the most gratifying "drives" in Canadian political history. What a true merit system in making appointments to the "outside service" of the Dominion Forestry Branch, for example, will mean to the Canadian people cannot readily be realized but most certainly the cutting out of "patronage" constitutes the greatest boon to which that department could fall heir. Furthermore, the success of the new principle may easily lead to its adoption by those provincial governments yet adhering to the prickly advantages of "patronage" in making appointments to the forest services.

### *A Bouquet from Winnipeg*

Most certainly, the prying loose of this keystone of Tammanyism in Canada has evoked an almost unbroken paeon of rejoicing from our newspaper editors, quite irrespective of political affiliation. Perhaps the strongest expression of all comes from the Winnipeg Tribune (Independent) which characterizes as a "damned scoundrel" any man who ever attempts the restoration of patronage in Canada.

A very considerable part of the newspaper campaign against patronage was in response to efforts of the Canadian Forestry Association for months past to point out the mischief wrought by the iniquitous system in the Dominion Forest Service. Every newspaper in Canada, having any substantial circulation, was provided with quotations from the Civil Service Act demonstrating the simplicity of bringing "the whole or any part of" the outside service under operation of the Civil Service Commissioners at Ottawa by a mere Order-in-Council.

Following is one of the Association's summarized statements which found wide use in the leading papers:

### *Technical Services*

"First steps in Civil Service Reform."

"There are certain obvious "first steps" in carrying out the reform of the Dominion Civil Service, as promised in the Union Government's initial manifesto. The Civil Service Commission of Ottawa has been asked to report on a plan for liberating the thousands of Government employees outside of Ottawa from the fetters of the local patronage committees, so that appointments and promotions shall be determined through the Civil Service Commissioners alone. While ultimately all Government officers, whether in Ottawa or in the "outside service" must be brought under the operation of the merit system, certain branches of the Government's work call for immediate application of the new plan for the riddance of patronage.

"It is doubtless highly desirable that not even a junior clerk in a town post office should be manipulated by a local political ring, but it is of much more account that the members of technical services should come in for the first application of patronage relief. One of these technical services is the Dominion Forestry Branch, with a large staff of field men responsible for the protection from fire of the enormous areas of forest in the prairie provinces and a section of British Columbia.

"Since the formation of the Forestry Branch, the greatest handicap on its usefulness to the people of Canada has been political interference with appointments to the field services, these services including not only fire ranging and inspection, but the important tree nursery work designed to supply Western farmers with shade trees and shelter belts.

Such a responsibility as devolves upon the Dominion Forestry Branch and other technical services ought to be freed with minimum delay from the blight of the patronage business. If there is to be any gradual introduction of the Civil Service merit plan into the "outside services," the technical departments which suffer most gravely are due for prompt action."

### "*An Insufferable Nuisance*"

"Patronage committees," said Toronto Saturday Night, "have become an insufferable nuisance to the Civil Service itself, particularly in technical branches like the Forestry Department. The scientific heads of such departments could not make suitable appointments of men with technical knowledge without being impeded by the threats and importunities of patronage committees whose members knew nothing or cared nothing about the duties to be performed."

### *A Proper Beginning*

"The Forestry Branch," comments the Independent Hamilton Herald, "has not been a solitary sufferer. The patronage blight has fallen upon every department of the public service. But the Forestry Association is right in holding that the merit system should begin in the service where special technical knowledge is necessary to efficient work."

Says the Halifax Chronicle:—

"What is true of the Forestry Branch is true, in greater or less measure, of all departments of the Administration, and it is to be hoped that the Government will lose no time in putting its declared policy into operation, not only as regards appointments but all business of the several departments."

### "*A Brake on Progress*"

"The ramifications of the patronage system are endless; they reach into depths that are unfathomable," argues the Ottawa Evening Journal. "The patronage system has been a brake upon political and economic progress, and has been responsible for more evils than the ordinary man can begin to appreciate."

Then speaking of the Forestry Association's assertion regarding interference with technical positions, the Journal adds:—

"Was there ever anything more absurd than the application of the patronage system to the selection and appointment of technical officers in the public service?"

### *Sir Robert's Manifesto*

The Union Government's assurance of future national immunity from the contagion of the patronage pot has been set down not only in very definite terms but by most practical action. Sir Robert Borden's second manifesto contains this statement:—

"The system of patronage in the distribution of contracts and office which has prevailed in Canada for generations has been the root of many political evils. But inveterate diseases succumb only to heroic treatment—and heroism has not distinguished Canadian parties in dealing with patronage. Hence the resolution to abolish trading in patronage, to fill public office by merit and not by favoritism, and to establish honest and open competition in awarding contracts and buying supplies."

### *Mr. Crerar's View*

Hon. T. A. Crerar likewise commits himself to the policy of Civil Service Reform in these words:—

"I am glad to say that one of the most important announcements in the statement of the new administration is that paragraph dealing with the patronage evil in Canada.

"The sole basis upon which people should be brought into the public service is their fitness for the position."

### "*We Mean Business*"

Hon. J. A. Calder's pronouncement, no less emphatic, is reported in the Winnipeg Tribune as follows:

"We believe that the time has come when an honest and sincere effort should be made to improve the civil service in Canada. Our civil service should be taken out of party

politics and men appointed to the service on grounds of efficiency and necessity and not on purely political grounds.

"I am talking sincerely to you men and women to-night and voicing the opinions of every member of this new government. We mean business."

*How The Commission Feels*

As an earnest of the Union Government's intentions, the Prime Minister requested the Civil Service Commission to prepare at once a plan whereby the outside section of the Civil Service can be brought forthwith under sole control of the Commissioners. A meeting of the deputy ministers and heads of departments was called by Dr. M. C. La Rochelle and an illuminating discussion resulted:

"You need not fear," observed Dr. La Rochelle, "any bad will or obstinacy on the part of the Commissioners. To the contrary, it is their earnest desire to co-operate with you and to do everything to facilitate the coming period of transition. It is their intention to frame a system of examinations, where examinations can be used, which will be submitted for your approval and that of the Governor-in-Council."

# *Searching For Aeroplane Woods*

The extensive utilization of British Columbia spruce for the manufacture of aeroplanes has called into the service of the Imperial Munitions Board a special staff of technical foresters, among whom are Mr. H. R. MacMillan and Mr. Roland D. Craig, the latter being "loaned" by the Commission of Conservation for an indefinite period.

The President of the Canadian Aeroplane Company, virtually a British Government creation, when at the coast recently made a thorough investigation of the possibilities. He said that there were great tracts of spruce in the province which would exactly meet the required conditions for aeroplane construction. The supply of spruce in eastern Canada was very limited and the manufacturers were compelled to look to the Pacific Coast. Considerable of the material now used comes from Washington, but the preliminary reports as to a supply from British Columbia as well as the suitability of the shipments already made were causing all aeroplane manufacturers to look toward British Columbia. Greater length and greater diameter than is now being supplied is what is sought in spruce for aeroplanes. One British Columbia district from which good reports as to a field of supply had been received was in the northern section in the Queen Charlottes and around Swanson Bay.

The Italian government is proposing to use fir as a substitute for spruce in aeroplane manufacture owing to the difficulty of securing spruce of proper size and quality. It is reported that a contract for 25,000,000 feet has been made with Washington lumbermen.

## B. C.'S TRADE POSITION

British Columbia mills have a possible output of 2,500,000,000 feet per annum of lumber, according to an estimate made by the "Victoria Colonist." On that side of the continent, says the "Colonist," there is the largest supply of merchantable timber. Pulp and paper mills when fully in swing will be able to supplement the shortage of products in the east and probably indefinitely supply the demand for paper. In the years 1912 to 1914 not more than five per cent. of the foreign lumber export trade on the Pacific was handled from the western ports, notwithstanding the natural resources, which are greater than all the States to the south. The figures, therefore, show that British Columbia, which is in a position to supply the major portion of the demand, is only in a small minority in actual trade.

# *Will Russia's Forests Pay Her War Debts*

By A. J. Slack

Director, Russian Information Bureau, New York

During the year 1915 the debit balance of Russia's foreign trade amounted to $385,000,000. During 1916 it rose to over $1,000,000,000. This was partially produced by war conditions, but after the war Russia must pay the interest on her national debt, and, therefore, the question of turning the balance in favor of Russia is one of the most important problems of Russia's economic life at the present time.

This problem is solved in a very interesting manner by the possibilities in the development of Russia's timber industry. The timber export even nowadays holds second place, following grain, in Russia's export trade.

*The Advance of Export*

In 1892 the receipts from the timber industry in Russia's ordinary state revenue amounted to $9,572,000—1.9 per cent. of the entire amount of state revenue. In 1913 the receipts from the timber industry increased to $46,11,176—27 per cent. of the entire amount of state revenue. During the period 1892-1913 the entire income of the imperial treasury was multiplied 3.5 times, whereas the income from the timber industry was multiplied 4.9 times.

The export of Russia's timber developed even faster than the timber industry in general. In the beginning of the nineteenth century, the export of Russian timber amounted to only $765,000—1.7 per cent. of the total amount of Russia's export at that time. In 1910 Russia's export of timber already amounted to $70,-482,000—9.5 per cent. of the total export. During the period 1800–1913, the total amount of Russia's export multiplied 21 times, whereas the timber export multiplied 126 times. It is interesting to observe that during the same period the amount of grain export multiplied only 44 times.

*Russia's Vast Forests*

In 1913, as we have said before, Russia exported timber to the amount of $84,099,000. But this amount is surely negligible compared with the possible export of timber. In exporting grain, Russia meets the competition of the United States, Argentina, Canada, the East Indies, Australia, Bulgaria and Rumania. But in exporting timber, Russia certainly can take and is going to take the leading place in the world's market.

I.

| | Amt. timberland (in acres) |
|---|---|
| Germany | 38,430,000 |
| Balkan States | 28,380,000 |
| France (without colonies) | 27,141,000 |
| Spain (without colonies) | 17,844,000 |
| Italy (without colonies) | 11,256,000 |
| Great Britain (without colonies) | 3,375,000 |
| Other European countries | 6,426,000 |
| Total | 132,852,000 |

Russia holds over 1,125,000,000 acres in timberland.

*Future Readjustment*

This table shows that timber is needed in all the European countries, exclusive of Russia, Scandinavia and Austria-Hungary. The import in Europe from the United States is comparatively small. Canada, perhaps in the near future, may become a great exporter of timber. Russia's chief competitors in the European timber market will be Scandinavia and Austria-Hungary. But the ex-

port from these countries has been diminishing during the last years. Scandinavia showed a tendency to increase the export of paper. As to Austria-Hungary, for the last years her competition with Russian timber has also become weaker and weaker. During the period 1906-1910, Russia exported to Germany 48.8 per cent. of all timber imported by the latter country. Austria-Hungary held second place, having exported to Germany 31.4 per cent. Since then, for the last three years before the war, Russia's export to Germany increased to 50 per cent. of the entire amount of timber imported by the latter. In the same time Austria-Hungary's export to Germany diminished and became only one-half of the amount Germany imported from Russia.

*Britain's Purchases*

The report of the Russian Consul in London, published a year ago, shows very clearly how wonderfully for the last years Russia is advancing in the European timber market. Until lately 70 to 75 per cent. of Russia's entire timber export went to Germany and England. During the last years it went to England more than to Germany. The per cent. of timber imported in England for the last 10 years from Russia, Scandinavia and the United States shows how successful was Russia's export for this period.

| | 1903 | 1907 | 1909 | 1911 | 1913 |
|---|---|---|---|---|---|
| Russian timber— | 29% | 37% | 46% | 47% | 51% |
| Scandinavian timber— | 23% | 32% | 25% | 25% | 25% |
| United States timber— | 33% | 28% | 27% | 26% | 22% |

Withal, until now Russia has not really utilized her wonderful timber resources. If we compare the export of timber in 1913, from Russia, the United States, Scandinavia and Austria-Hungary, with the amount of timber land in these countries, we see that Russia, while richer in timber land, is behind the other nations in the amount of foreign trade in timber.

| | The amount of timberland (in acres) | The export of timber (in dollars) |
|---|---|---|
| Russia | 1,125,000,000 | $89,250,000 |
| U. S. | 603,000,000 | 134,437,000 |
| Scandinavia | 81,000,000 | 129,489,000 |
| Austria-Hungary- | 63,000,000 | 79,203,000 |

*Will the Forest Pay for War?*

The new Russian Government and the Russian people understand that after the war the need of timber in the European market will open wonderful prospects for the Russian timber industry. By proper development of this industry, Russia will be able to deliver the bulk of the timber necessary for the European countries. It is very possible that in this line Russia will not meet serious competition, neither from Scandinavia nor from the New World. As to Austria-Hungary, she will have her own needs, and aside from this, a big part of her rich timber lands in Galicia was destroyed during the war.

The development of Russia's timber industry and the export of Russian timber to the European market means for Russia the practical solution of most of her financial difficulties that are bound to arise after the war. The development of the timber industry will create a favorable foreign trade balance and will assist in the payment of the national debt.

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## A MARITIME MEMBER'S VIEW

From a Chatham, N.B. Life Member of the Canadian Forestry Association: "I enclose my cheque for $15. The Association is an excellent one, is doing most praiseworthy work and deserves support."

---

More than $7,500,000 are paid annually into the provincial and federal treasuries of Canada as timber and pulp-wood dues by commercial companies. British Columbia receives the largest amount, over two million dollars a year.

# Some Causes of 1917 Timber Losses

## The Preventable List Continues to Loom Large. British Columbia's Fire Damage Summarized.

As fire protection systems become more thorough, it will be possible to learn more accurately the causes of the annual series of forest fires. Already the gathering of data is fairly thorough in many sections of the country, but taking Canada's forest areas as a whole it is impossible at the present time to compile statistics of fire loss of more than approximate reliability, or with more than a partial listing of the causes. The ascertaining of causes is of the highest importance in fixing responsibility and directing educational efforts towards prevention.

The Forestry Journal is able this month to present the statistical record of British Columbia's 1917 forest fire experience, the figures of which while not final are approximately correct:

**Total Fires in Province during 1917—930.**

**Fires upon which extra help was employed—345.**

**Total area burned over—211,455 acres.**

**Area of merchantable timber damaged—89,000 acres.**

**Amount merchantable timber damaged—213,360,000 F.B.M.**

**Amount of merchantable timber salvable—38,933,000 F.B.M.**

Losses in:

| | |
|---|---|
| Merchantable timber | $178,401 |
| Valuable reproduction | 6,563 |
| Standing timber on old burns and cut over lands | 125 |
| Damage to stock range | 6,075 |
| Forest products, buildings, railway and logging equipment etc. | 182,004 |
| Total Losses | $373,168 |

**Lives lost fire fighting—8.**

**Horses lost—11 (in one fire).**

**Prosecutions for infringement of provisions of fire law 8, convictions 6, cases dismissed 2.**

As to the causes, the Journal has not yet received official information. Local reports and the statements of some of the District Foresters assign definite origins for some of the worst conflagrations as follows:

Spruce Valley fire:—Dropping lighted tobacco on the floor of a tent; also the presence of a heavy lumbering slash.

Kalamalka Lake fire:—An unextinguished camp fire left by a fishing party.

Crows Nest Valley fire:—Heavy debris in neighborhood of mill which caught flying sparks.

In the territory of the St. Maurice Forest Protective Association, Quebec, (about 12,000 square miles), 217 fires occurred in 1917, of which no fewer than 122 were set by railway locomotives. Mr. Henry Sargins, the manager, gives the following origins:

| | |
|---|---|
| Railways | 122 |
| Sectionmen | 4 |
| Unknown | 38 |
| La Loutre Dam. Const | 26 |
| Drivers | 5 |
| Constructionmen | 8 |
| Fishermen | 8 |
| Settler | 4 |
| Jobbers | 2 |
| Total | 217 |

It will be noted that the settler, recently the most prolific source of forest damage, has dropped to second to last place in the list. This is a fine tribute, indeed, to the success in applying the "permit law" for the setting out of land clearing fires. While the St. Maurice association commenced its career with a number of prosecutions and convictions of settlers for causing fires (and these doubtless, were salutory) it has directed its main effort towards winning the good will and co-operation of the

settler and has been eminently successful.

The fire losses on the St. Maurice Association's territory this year have been kept down to a very gratifying point.

Of merchantable timber, the loss was 287 acres; young growth 216 acres; cut over lands 2272 acres; old burn 1592 acres. Total 4367 acres, or a little less than 61 square miles.

# Canada's Debit Account for Forest Fires

*Forest fires in Canada since Confederation have destroyed vastly more of the nation's wealth than all other kinds of fires put together.*

The fire losses paid by insurance companies in Canada since 1867 amounted to $272,250,777. The actual property loss is ascertainable at about 25 per cent. over the foregoing figure. This refers to ordinary property, houses, contents, factories, etc., and includes practically no standing timber which only in rare instances is insurable and that only during the past few years.

It has been generally accepted as a modest estimate that for every foot of timber ever cut in Canada, seven have been destroyed by fire.

Placing government stumpage dues at the very low rate of 50 cents a thousand feet it is not unreasonable to assume that the public revenues have suffered by scores of millions of dollars. It may not be fair to accept such a total as a thousand million dollars, as does the Montreal "Financial Times," because Government dues would not have been collected by any means on all the timber that has gone up in smoke, although every square mile of public-owned forest must be regarded as possessing potential public revenues. If one considers the actual and potential sources of gain to the Government treasuries, probably a billion dollars is not extreme as the total of the penalty visited upon the Canadian people through forest fires.

## CLEANING UP DEBRIS

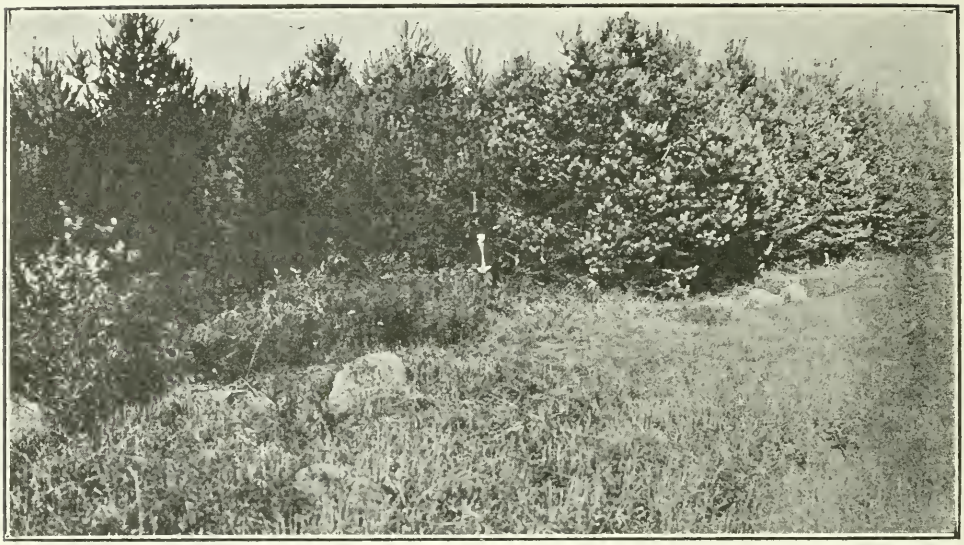
The following appears in recent advertisements of an auction sale of timber berths by the Department of Indian affairs:

"Half of the cost of adequate fire guardianship will be a charge against the licensee, and the safe disposal of brush, tree-tops and other debris resulting from the lumbering operations must be arranged for under the supervision of the Department."

The provision regarding brush disposal is being carried out with commendable care and is said to have met with willing cooperation from the licensees.

## SEEK BETTER METHODS

The British Columbia Loggers' Association is a helpful organization. The latest work undertaken for its members is the inauguration of a department which undertakes to teach the foremen and buckers how to cut the logs to the best advantage. In carrying out this work the services of A. L. Bryant, formerly supervisor of scalers, has been secured. His duties will be to visit the logging camps of the members and check up the system of cutting the logs, pointing out if necessary where the logs can be cut to the best advantage, considering both taper and grading. The fir, cedar and spruce logs are graded into three classes. It is the intention perhaps next spring to purchase a motor-boat for this service, thus making the inspector independent of the regular boat service.



Sixteen Year Old Scotch Pine, Axton, Adirondacks

# An Adirondack Forest Experiment

By R. H. Campbell, Director of Forestry, Ottawa

## Removing Hardwoods to Encourage Conifers. Dr. Fernow's Plan of Management Well Justified.

In a recent article in the Revue des Eaux et Forets on the Moral Responsibility of Foresters it was pointed out that the full results of the forester's work are often not apparent until after he has passed from the scene and, referring to one of the French foresters of the beginning of the last century named de Buffevent, makes the following note on an idea of his for fixing the moral responsibility, even though a posthumous one, on the individual forester for his work:—

"De Buffevent attempted to fix this undetermined responsibility. He thought of inserting in one of his studies of management a table indicating, for each cut, the names of the foresters who had marked the trees to be left standing and at the same time mentioning the number of such markings, old and new. That is an idea worth careful consideration and if the official statement of management does not give sufficient publicity could it not be increased by inscribing on the tract itself the names of those responsible for the system followed. A plate of enamelled iron, placed upon a corner at one angle of the cut, would be sufficient to show the following generation the names of those to whom it owes its riches or its poverty and, although too often posthumous, gratitude or cursing would have its proper object."

This passage occurs to the mind in connection with a recent visit to the tract in the Adirondack Mountains in New York State which was at one time put in charge of the Forest School at Cornell University, and the plan of operations therefor laid out

by Dr. B. E. Fernow. There was much discussion and argument at the time as to the wisdom of the plans adopted and the opposition to it developed to such an extent that the whole of the experiment had to be abandoned before it was well begun, but sufficient remains to show what would have been the results if the experiment had been carried through to completion and the showing is one to which Dr. Fernow has no reason to be ashamed to have his name attached in any manner, and public opinion which at the time of the inception of the experiment was inclined to be severely critical has changed its attitude and is now inclined to praise.

*Demonstration Tract Created*

Shortly, the history of the tract is as follows:—

The New York State College of Forestry was established by an act of the State Legislature in 1898 as a department of Cornell University and in the same act provision was made to establish a demonstration forest of not more than 30,000 acres for the purposes of education and instruction in the principles and practice of scientific forestry. The forest area obtained for the purpose is located in Franklin County on the Raquette River and had been partly logged over by the Santa Clara Lumber Company. The headquarters of the tract were at Axton and the town of Tupper Lake, a saw mill centre located on the Ottawa and New York Railway, was within easy reach, being only three miles from the western boundary of the tract. About one-half of the property was virgin timber, the other half more or less culled of pine and spruce and a small portion burned over land. The stand was composed of sugar maple, yellow birch and beech, mixed with spruce and hemlock, and in some parts with white pine. Most of the merchantable pine had been taken out in the lumbering operations and also considerable of the spruce. There were also balsam and cedar swamps and the burnt over lands were largely grown up to aspen, poplar and white birch. In quantity the hardwoods were to the softwoods in the proportion of two to one.

*Supremacy of Conifers*

The problem to be dealt with and the methods proposed may best be stated in Dr. Fernow's own words:—

"The most valuable crop to be grown in the Adirondacks—and, as for that, in most locations of the Northeastern United States—and especially for the State, are the conifers. Coniferous wood represents three-quarters of the total wood consumption of this country and there is no reason to expect a change. Spruce and white pine hold now and promise for all future to hold the most important position in the northern market, hence their reproduction should be the main object of the forester's skill. Mixed with the hardwoods, as they originally were, the white pine, culled out as the most easily marketable wood, has been almost eradicated in the Adirondacks, because it cannot reproduce under the shade of the remaining deciduous trees and spruce; the spruce being more tolerant of shade, has persisted in producing young growth but by culling it out of the mixed forest, as it is culled in the usual lumberman's fashion, with the hardwoods left, not only is the development of the young spruces retarded and stunted, but in the composition of the crop it must, by necessity, take a less prominent part.

*Hardwoods Superfluous*

"It is then the reduction and removal of the old hardwoods, which alone assures success in the silvicultural program of re-establishing and giving advantage to the conifers. If this program be conceded as correct, then it might appear even good business policy to be satisfied if only the cost of removal of the undesirable material were covered by its sale. To find a market for the hardwoods, minor material as well as logs, is the key to the solution of the silvicultural problem; increase in the proportion

of the more valuable spruce and pine."

The disposal of the hardwoods was then the first problem to be undertaken. The mills at Tupper Lake, the most convenient railway connection, took their logs out by water and were cutting only softwoods. It was necessary to provide some means for utilising the hardwoods which included the carrying of them by rail to Tupper Lake. A great deal of the hardwood was, however, only suited for fuel but could not stand the cost of the haul to any market which would be large enough to absorb it.

### *Stave Plant Erected*

Not to follow out the details of the negotiations it may be stated that finally the Brooklyn Cooperage Company were induced to enter into a contract to erect a stave mill and a wood alcohol plant at Tupper Lake and a railroad to take out the material from the woods, the company to get the entire hardwood crop, logs and cordwood, that might be cut for the next fifteen or twenty years, delivered to them at the railroad at a fixed price. The Brooklyn Cooperage Company were already the operators of stave mills for supplying the American Sugar Refineries, but the wood alcohol plant which was suggested to utilise the smaller and rougher material was a new enterprise to them Almost immediately after the contract was entered into in 1901 costs of labor and supplies rose rapidly and it was found that to continue to supply the hardwoods under the contract would involve a loss. This losing contract for the state helped with other things to precipitate the trouble which finally brought the experiment to an abrupt conclusion.

### *Contract Criticized*

The contract has been criticised as improvident but it may be pointed out that there were many other contracts made at the same time that ended as unprofitably and for the same reasons, and that this contract received criticism beyond others because it was a public contract and therefore open to general criticism. Whether better business management in the operations in the woods could have prevented the loss even under the contract as it stood is possibly a matter for argument, but no opportunity to demonstrate it was given and it may fairly be suggested that in the first essay at such an important experiment by the state the question of profit might very well have been left outside of consideration until the methods were demonstrated.

### *Industries Now Flourishing*

As a result of the situation the wood alcohol plant was closed down but the cooperage plant continued to operate and later the wood alcohol plant was started again to utilise the waste of the stave mill and both of these industries are found to be flourishing at the present day. The Oval Wood Dish Company of Michigan is now also establishing a plant at Tupper Lake for manufacturing hardwoods, particularly the dishes that give the name to the Company, and Tupper Lake is thus becoming an important centre for hardwood manufactures. It is possible that this might have been the result in any case but the fact remains that the initiation of business on such lines was due to the College experiment and that the local inhabitants are prepared to give the credit to it for the bringing about of the establishment of hardwood industries in the town.

### *The Planting Programme*

The discussion of the hardwood industries has been carried through to a conclusion as it seemed to be simplest and clearest to do so, and we may not return to its effect on the woods operations. The disposal of the hardwoods being provided for, it was possible to make almost a clear cutting and in order to ensure a fairly full restocking with conifers it was necessary to provide for considerable planting. A forest nursery was therefore started at Axton followed by another one in the Wawbeek Division

of the tract. The reason for providing the second nursery was in order to get better soil than was available at Axton and also to have a supply of nursery stock near the scene of operations. The Wawbeek Division, being nearest to Tupper Lake, was to be cut over first. In the report submitted in January 1900, 1,500,000 seedlings were reported in the nursery at Axton, and in the report submitted in January, 1902, the number of seedlings in stock in both nurseries was given as 1,250,000.

### *Ten Dollars per Acre*

Plantations were made in 1901 and 1902, on a total of 225 acres, partly on the cut over areas and partly on old fields and burns, 232,000 trees, two and three year old seedlings, being used for the purpose. The cost of planting, including cost of stock, was about $10 per acre. The species used were white pine, Douglas fir and Norway spruce, with lesser quantities of Scotch pine, Riga pine, European larch, red pine and white spruce.

A visit made to these plantations in 1906 showed the young trees hardly visible among the undergrowth of ferns and other vegetation, the whole experiment abandoned and the plantations left to take care of themselves owing to opposition, powerful in political circles, from people who objected to any timber operations in the district at all, and who finally secured the veto of the appropriation for the Forest School.

The plantations, though without care and in spite of some damage from fire, have remained, and an opportunity of visiting them during the present year allowed of some comparisons and an appreciation of the development of the plantations. Unfortunately from some points of view, the visit was made alone and therefore unaccompanied by anybody who had been connected with the experiment and who could have made the visit more instructive On the other hand, the conclusions reached are unbiassed from the absence of such a mentor.

**Sixteen Year Old Scotch Pine, Axton, Adirondacks.**

### *Fine Height Growth*

A plantation of white pine, Scotch pine and Norway spruce, westward of the headquarters at Axton, was found to be growing vigorously, the pine trees reaching eighteen to twenty feet in height and making rapid height growth. The Scotch pine had made the most robust growth but the white was healthy and adding rapidly to its height. While the spruce generally lagged behind it was not unhealthy and in some cases its height growth rivalled that of the pines. Nearer the headquarters even finer specimens of planted white pine were found associated with some evidently of older growth To the east a plantation of Scotch pine, which had evidently been set out on an old field and is an outstanding feature of the landscape, was visited and showed

the same evidence of vigor, rapidly becoming a dense forest.

### *A Pronounced Success*

In the Wawbeek Division near Axton a plantation of white pine, Scotch pine and Norway spruce made on cut over lands was seen and formed a marked contrast to the unplanted lands in the vicinity. Finally a plantation of Scotch pine made on burned over lands was examined. It formed a dense young forest, almost impenetrable, and, though small in area, should in time furnish a splendid stand of timber. Farther along the road the results of letting a fire run into this young growth were seen and formed a most unpleasing contrast. While the plantations show lack of care in some respects the general impression left is that they are a pronounced success and should have been carried to completion.

While a less hasty visit and with someone fully acquainted with the original experiment would have brought out fuller and more exact information, yet it is thought that even this slight sketch of the situation is a fair summary of its general aspect. One striking feature was the unanimity of opinion in the district, so far as it was met, that the abandonment of the work was a serious mistake.

Stock from the forest school nursery was supplied to the State Commission in 1902 for planting on state lands and stock remaining in the nurseries was used for similar purposes later, and if the initiation of the active and successful nursery and plantations established by the state is due in any degree to the Forest School experiment it is surely justified by its children.

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A Glimpse of the Annual Log Harvest that Pays into New Brunswick's Treasury Over Half a Million Dollars a Year

Hauling Out Logs on a New Brunswick Timber Limit

# Nova Scotia's Forest Position

By F. C. Whitman

Annapolis Royal, Formerly President, Canadian Forestry Assoc.

## Deteriorating Source of Wood Supplies Runs Up Production of Fishing and Farming Costs.

In the early "nineties" and up to 1904 the forest fire laws were not enforced in Nova Scotia, and during this time Nova Scotia experienced very disastrous forest fires, than in a single County swept over 40,000 acres. Fires in the Province scorched thousands of acres of woodland and its effect is plainly marked to-day. It will take years for this land to come back again to a producing condition. I am pleased to say that it is coming back and what was a short time ago a blackened territory is now green again with the natural production of forest trees. In the County mentioned reckoning the 40,000 acres at the low estimate of 500 feet of lumber to the acre, it means a loss of twenty millions of feet that would have cut a million feet annually and have made a distribution of ten thousand dollars a year in wages. It will take forty years at the very least before this burnt over land can be expected to give a reasonable cut of wood.

These fires awakened the public to the necessity of putting the fire laws in force, and the Government on being urged, passed an Act in 1904 for the Protection of Woods Against Fires, and with amendments this Act is now in force in most of the Coun-

ties that have forest land. In 1913 the Act was amended and consolidated and is now entitled the *Forestry Protection Act.*

*A Good Fire Law*

It has met with a most favourable reception by our own people and has been strongly commended by leading Forestry Authorities in Canada and the United States.

In practical working it demonstrates that fires can be prevented or if started can be stopped. If there is any County in the Province that has land more suitable for growing wood and timber than for any other purpose it should come in under this Act and take advantage of it to protect the growing trees and increase a needed supply of wood. Let me say that the City of Halifax should be interested. They have a beautiful spot on the North West Arm, much of that beauty is in the environment, and if forest fires are allowed to creep in as they have been doing in the past few years it will surely spoil the appearance of the Arm and be a disgrace to the City of Halifax. That is not putting it too strongly for a little co-operation between the City authorities and the County would put a stop to the almost annual burnings.

*Deterioration Set-in*

To many, Forestry and Conservation seems to mean a stop to the production of lumber; but lumber under forestry methods leads to a greater production and the assurance of a future supply.

What has stopped the larger output of lumber has been fires, and overcutting. Cutting down the trees faster than the annual growth, and natural reproduction can fill up the gap. Where fires have been severe, or where there has been more than one burn over the same piece of land, it takes from forty to sixty years to reproduce commercial lumber.

In Nova Scotia we started at the top of the ladder and came down and we have now to start almost at the foot of the ladder and climb. That is to say, in lumbering the virgin timber and the older growth has been disposed of, and year by year the quality and average of cargoes of export lumber has steadily deteriorated. Nova Scotia is at a point where it is absolutely necessary in the first place to prevent forest fires; and in the second place to be more conservative in the cut of lumber and to let the trees grow.

*Few Seed Trees Left*

Pine lands will reproduce pine if a sufficient number of seed trees are left standing; unfortunately this has seldom been the case in Nova Scotia. It is the same with spruce, the next wood in value, and the more profitable and quicker to reproduce. The least valuable is the hardwoods and these seed more readily than any other kind. The seeds are small and plentiful, there is an annual crop that spreads readily by the wind and is carried for miles in the Winter on the snow. This seed finds a quick lodgement in cut over or burnt lands and accounts for its rapid reproduction as compared with pine or spruce.

A few years ago the Provincial Government completed a Forest Survey of Nova Scotia. Accompanying the report is a detail map of the whole Province and more particularly the forest areas. It shows in colour the burnt land and the barrens, the stands and growth of pine, spruce, hemlock, hardwood and mixed growth. When making this survey the Government maps or plans were corrected and consolidated as near as it was possible to do so, for the early forest surveys and land locations have not been at all accurate.

*The Forests Coming Back*

It is said of Nova Scotia that artificial planting or seeding is not needed, and that natural reproduction is all that is necessary to give a continuous growth, provided forest fires are stopped.

The Forest Survey of Nova Scotia is a starting point, and at any time comparisons can be made to see if we are progressing or retrograding. It is my opinion under the admirable working of the present fire laws that

Nova Scotia in its stand of timber and extensive new growth of all kinds of wood is progressing.

It would be impossible in this paper to take up all lines of reproduction and use of Nova Scotia's forest woods. I will therefore take it up as follows:

*Cooperage Doubles in Price*

Outside of the bigger interests in Lumber production, I think the matter of Cooperage and the pressing need of an annual supply of barrels, fish packages, and boxes will appeal strongly to the farmer, fishman and manufacturer. For many years dependance has been placed on the saw mills for a supply of side boards, and log ends to be cut into heads and staves. This supply has fallen off and the price of material advanced to twice the former cost. In hoops the supply has been uncertain for several years past, and notwithstanding the importation of cooperage and hoops from New Brunswick, Ontario and abroad, the cost of a barrel has increased and is likely to be more difficult to obtain and more costly in the future.

*Woodlots vs. Dear Coal*

Nearly every farm in the Annapolis Valley has a woodlot and with proper looking after it can be a source of profit in producing wood for farm use and for cooperage.

The pinch in coal this year makes a generous woodpile at the door yard look a pretty good thing to have. The wood pile is of more importance, more consumers need it, and its value has increased. Speaking personally I find the measurement has decreased. For stave wood spruce is the best. It only requires a small sized tree and now is the time to consider whether it would not be good planning to let the woodlot produce stave wood. A thinning out of too thick a growth, trimming off the low branches, letting in the light and air, will quicken the growth and turn a wood lot thicket into a producer of good wood.

*Cheaper Hoops from France*

Just before the war a buyer of hoops could not be supplied in Nova Scotia, and on inquiry found that the hoops required could be imported from France at a price delivered in Halifax the same as usually paid for this kind of hoop produced in New Brunswick and Nova Scotia.

The French grow the hoop poles as a crop. They have acreage in hoop pole trees that are systematically cut every year, and are thus able not only to supply their own wants, but also able to export them to other countries. Anyone would imagine on looking over districts in this Province where young birch trees are growing, that the supply of hoop poles was unlimited. The man who cuts them will tell you that perhaps one hundred trees out of a thousand are suitable, whilst the rest are either too small, or too large for practical working, or waste wood owing to defects and decay. On the other hand if a tract of young birch was looked after, culled when growing, a first cut of poles made when the bigger trees reached the proper size, the tract could be put in such shape that it would produce an annual crop with economy in time and labour and natural reproduction would fill in the cuttings.

It must be apparent to any one that such a tract of land would have a cash value far greater than ordinary wild land.

*The Prop of Permanence*

Since writing the above I have read the following article in a paper on Present and Possible Products from Canadian Woods, by John S. Bates A.M. Canadian Society of Civil Engineers.

"There are several general conditions which should be kept in mind by every Canadian. Canada is considered to be the third country of the world in value of Forest Resources. Russia first and United States second in the list. Contrary to public impression forest surveys indicate that Canada's present supply of merchantable timber is only one fifth or one quarter of the supply still available in the United States.

"There is real necessity for the

extension of adequate protection of our present forests, wise utilization of the timber when it is cut and foresight in planning for natural and artificial reproductions. Trees are becoming to be regarded more and more as a forest crop, and with proper system there is no reason why our forests should not be a source of expanding and permanent wealth.

# Over 7,000,000 Trees Planted on Prairies

On the farms of the prairies of the three provinces during the season of 1917, 7,450,000 trees have been planted by the joint co-operation of the forestry department and the farmers with the three-fold object in view of providng the farmsteads with shelter belts, the farmer with a possible future supply of wood, and of adding pleasing effect by beautifying the landscape of the prairie homeland. Incidentally, trees are said to have an important effect on the weather and climate, as well as in the supply of moisture. Certainly they tend to check the winds and by catching the drifting snow, they may be used to increase the supply of moisture in the soil of field or garden, an end much desired in certain sections of the prairie west.

The deciduous trees are of five kinds, maple, ash, Russian poplar, caraganna, red willow and aspen leaf willow. The evergreen trees include white spruce, lodge pole pine, jack pine and Scotch pine. The deciduous trees are supplied free by the forestry department, and the nominal charge of a cent each is charged for the evergreens. The express from Indian Head, Sask., is paid by the applicant in each case.

*Inspectors Tour Country*

In order to supervise the work and to see that the ground is properly prepared in advance by summer-fallowing, and to see that the trees are properly cared for after they are planted, nine government inspectors are kept busy during the summer season visiting the plantations and inspecting the preparations made by applicants.

On one of these inspection trips Inspector J. Cowie visited the Edmonton district a few days ago. His inspectorate extends from the International boundary to as far north of Edmonton as there are likely to be applicants for trees, from the Saskatchewan boundary to the tree clad slopes of the Rock mountains. The territory is so large that a large slice to the north-east of the Red Deer river has been placed in another inspectorate, covered by an inspector who also visits northern Saskatchewan.

In 1916 Inspector Cowie dealt with 1,327 applications and plantations, and in 1,130 there was a decrease to 1,130 locations. The decrease is due to the scarcity of labor since the war, causing the farmers to have less time to prepare ground for planting trees.

*80 per cent. Turn Out Well*

About eighty per cent. of the trees planted have turned out well, and where there has been failure it has been largely due to uninterested tenants on rented farms, the enlistment of farmers, and the selling or abandonment of farms. Only about five per cent. of the failures were due to gross carelessness. The most successful trees proved to be Russian poplar and caraganna, and among the evergreens the white spruce has proved to be the most adaptable to Alberta. The pines are best suited to rocky districts.

Some farmers on the prairie have found that the double shelter belt has enabled them to grow small fruits most successfully. The outer belt of trees catches the drifting snow, and the garden of berry patch is planted in the treeless land between the inner and the outer shelter belt. The farm yard is often located inside the inner belt, where the family and live stock are quite comfortably located, even on

the prairie which was once noted for its blizzards. In the distrcits near Edmonton this would not apply as much as it does to those settlements where there are no trees except those planted by the settler. In many districts to the north and west of Edmonton the trouble of the pioneer homesteader was to get rid of the natural growth of trees. But now that the native brush is being cleared off, the settlers of the Edmonton district are frequently turning their attention to the planting of shelter belts around their farm buildings. With the satisfactory supply of moisture found here, there is little or no difficulty found in growing these trees.

*Another Plantation Started*

The forestry department have on their farm at Indian Head a plantation of 480 acres devoted to the cultivation of trees and demonstration plots. Owing to the increase of applications in recent years, and to supply the demands of a large area, another plantation of 320 acres has been started at Sutherland, Saskatchewan, and sown with seed that will in due time produce a crop of trees. These tree plantations are under the supervision of Norman Ross, chief of the Tree Planting division of the Forestry Department, with headquarters at Indian Head. To him all applications for trees should be made.

The trees are supplied for planting on the farms only, and must not be planted in towns or cities. Those wishing to plant trees in 1919 must have their applications in before March, 1918. The ground on which the trees are to be planted must be summer-fallowed the year previous to planting, and a satisfactory report is received by the department from their own inspector before the trees are sent out.

## THE PRESS IN CANADA

There are 1381 publications of all kinds now being issued in Canada, including 138 dailies, 4 tri-weeklies, 40 semi-weeklies, 921 weeklies, 222 monthlies, 1 bi-monthly, and 16 quarterlies.

## A WOODLOT'S FINE RECORD

*(By the Editor of the "Weekly Sun" Toronto)*

After a somewhat strenuous day in picking plums and tomatoes, I took a stroll in the early afternoon out to the plantation of young pines at the rear of the farm. This was the first time I had seen the trees at close range since last spring, and I was simply amazed at their growth since planting, and particularly during the past summer. The trees, no bigger than young tomato plants when set out five years ago, now have an average height of around six feet, many of them being eight feet or better. They were planted about four or five feet apart, and practically all the ground occupied is now shaded by a vigorous growth. In some places the limbs are so intertwined that it is a matter of difficulty to force one's way between the rows. So few of the trees died at the start that the loss is hardly noticeable, and I did not find more than three weak ones among the thousands that remain. The plantation covers a three-cornered hillside at one end of the farm, and is protected by line fences on two sides and a wire fence, separating the woodlot from a permanent pasture, on the third side. There is no part of the place which gives greater satisfaction than the woodlot on the hill, with the silver stream winding through the always green pasture below.

## FORESTRY PROFESSOR IN FRANCE

Prof. W. N. Millar, recently of the Faculty of Forestry, Toronto University, is now in France as Captain of Company A, 10th Engineers. His company is engaged in preparing materials for docks, warehouses, railroads and cantonments for the American troops and the order calls for 140,000,000 feet B. M. of materials of all kinds.

The smallest type of mill to be used will be capable of cutting 5,000 to 6,000 feet. It is claimed that these little shavers can be set in ten minutes and changed in twenty minutes. They will follow the cutting.

# "Manitoba a Forest Province"

Manitoba, a province naturally well endowed with extensive forests in its northern sections where farming will never play a large part, shows a total revenue of $12,000 yearly for the Dominion Forestry Branch, as against $100,000 spent by the Branch on the necessary work of fire protection, and improvements.

Sweden takes for the public treasury from its forests $5,000,000 gross revenue a year, $3,000,000 of which is net revenue.

As to the analogy between conditions in Manitoba and Sweden, we reproduce the following from "Manitoba, A Forest Province," by R. H. Campbell, Director of Forestry:—

"Sweden has probably the advantage of Manitoba in having better drainage in some of the northern areas and in having a more extended sea coast, with quicker and cheaper access to long established markets, but I cannot see that other conditions exist that give Sweden an advantage over Manitoba if the forest areas were in as good condition. This they are not at present, nor will they be for a long time to come, and it will require a large expenditure on protection and improvements without regard to revenue during that time, to bring the forests into good condition and to produce a revenue that will more than offset the expenditure. Under the administration of the federal government the forests have been allowed to get into such an unsatisfactory condition and the federal government should make the necessary expenditure from its large revenues to place such a great natural resource, and so important to the prosperity of the province and of the whole country, in a condition of permanent security and producing power so that it may regularly and continuously produce a revenue for the State and the raw material for industries.

# Forest Nursery Plans Great Extensions

During the past year, more than 500,000 forest tree seedlings have been shipped from the Quebec forest nursery at Berthierville, P.Q. The provincial forester, G. C. Piche, reports that of these, nearly 200,000 were white pine, 180,000 Norway spruce, 82,000 Scotch pine, 20,000 Douglas fir, 8,000 red pine, 7,000 white spruce, and 6,000 tamarack, the balance being made up of relatively small numbers of other species, mostly hardwoods, to supply the demands of farmers. The great bulk of the demand was, however, for the reforestation of burned-over non-agricultural lands. The Laurentide Company, Limited, and the Riordan Pulp and Paper Co. were heavy purchasers of plant material from the provincial nursery, in addition to supplies secured from their own nurseries. The Perthuis seigniory also has purchased a large number of small trees from Berthierville annually during the past seven years.

To date, the provincial nursery has shipped a total of more than 1,500,000 trees since its inception; of these, more than half have been supplied during the past two years. The demand for planting stock has become so insistent that the provincial forester announces the proposed extension of the capacity of the Berthierville nursery to 3,000,000 seedlings annually. Of these, the majority will be Norway spruce, which is believed to be the most suitable for pulpwood production.—*C. L. in "Conservation."*

# The Story of Canada's Forests

By The Secretary,
Canadian Forestry Association

## From English Conquest to the Great War the Forest has proved a mighty possession

(*Article published also in Confederation Number of Toronto "Mail and Empire"*)

THE lumbering industry is probably our most widely distributed manufacturing enterprise. It is also one of the oldest, ranking with the fur trade, and the first attempts at extensive settlement. Since Confederation, and before it, it has retained more than most industries the conservative traditions of independent organization and manufacturing methods.

In numbers of plants, in wider location of woods operations and selling agencies, the growth has been, of course, enormous; but as relates to any mechanical or marketing evolution, a blue print of a group of 1917 saw mills would differ chiefly in bulk from the manufacturing scheme of 1867. There have been refinements, a closing out of the amazing waste at the mill end, a speeding up of processes; but the conservatism of lumbering as compared with the making of shoes, the manufacture of foods, the fabrication of steel, is striking and distinctive. Science and invention and market developments have to a great degree spared lumbering from the upsetting changes that have scrapped the machinery and methods of other undertakings in five and ten year periods.

### *Lumbering Has Developed Canada*

For all that, Canada owes to the lumbering industry an almost incalculable share of her national development. From first to last, the lumberman has been a great employer—an indispensable source of winter revenue to the early settlers, a magnet for foreign capital, a lavish distributor of wealth extracted from a natural resource. To-day, touching only the bald statistics of the thing, the wood-using industries of all classes employ more capital, pay more wages, and employ more men than any other industry except Agriculture.

It is an interesting fact that whatever other natural resources we may consider, whatever commercial activity may be under discussion, the necessity for a wood supply enters at one or another stage. The Canadian Pacific Railway, for example, needs annually 5,000,000 track ties, 50,000 telegraph poles and 60,000,000 feet of lumber to operate the system. The coal mines of Nova Scotia or Alberta are dependent upon pit props in great abundance, for it takes six lineal feet of wood for each ton of coal produced. The fisheries require wooden boats, boxes and barrels. The farmer is helpless to extract a dollar from the most fertile land without the accessories of a wooden home and barn, wooden fence posts and fuel, wagons, implements, churns, and a hundred other products of the tree. Practically no other activity from a daily newspaper to an Arctic whaling fleet can carry on without the aid of manufactured wood.

In the light of the present enormous development of wood-using plants—attaining nearly $200,000,000 worth of products a year—it is not the least interesting part of the story to find how in the days of our French and English forefathers the public policies towards the mighty forests manifested barely a trace of prophetic vision. None apparently reckoned upon a day when more than 5000 busy plants lying in a winding chain across the Dominion would look to the forest for their raw materials or when 110,000 men would get their living from the 'fabricating' of trees.

*The Beginnings of Lumbering in Canada*

Opening a page of Canadian historical records at 1683 we come upon seignorial grants conditioned upon 'the preservation of oak timber for the building of vessels.' Pine and other woods were merely occupying good room. Only the necessities of the Royal Navy caused any reference to the *value* of a forest in the deeds or land policies of that time. Likewise in 1713, 1747, and other years, we find the French Governors reserving areas for oak timber for ship and bridge building. Down to the close of the French regime no industry had evolved from the forest resources except as applied to labor in getting out naval timbers.

From the time of the occupation of the British in 1763, new demands arose. White pines adapted to naval masting and accessible for water carriage were expressly reserved for use by the Home Government. Thirty-four years afterwards licenses were issued to contractors for the Royal Naval Dockyards who in turn sublet the cutting and export rights to merchants and lumbermen in Canada. Therein was provided the first substantial impetus towards extensive exploitation of the forest. The privileges of our present licenses may sometimes seem elastic enough, but what would be said to-day to a timber license, granted in 1808, by the naval authorities, to "travel into and search our woods in our provinces of lower and Upper Canada where we have reserved to us the property in any woods or trees and the right of cutting them, and there to fell and cut so many good and sound trees as may answer the number and dimensions of said contract." A license giving one firm the pick of probably 350,000,000 acres of merchantable timber!

The remoteness of Canada's timber from the European user and the small capacity of ocean carriers was not the worst handicap in our lumber development, for a strange prejudice against Canadian woods had gained hold in the British market. Giving evidence before a British Parliamentary commission in 1820, Alexander Copland, a timber merchant and builder stated that "Norway, Swedish, Russian, and Prussian timber is very superior quality to that imported from America. The bulk of that is very inferior in quality, much softer in its nature, not so durable, and very liable to dry rot. Indeed, it is not allowed by a professional man under Government to be used, nor is it ever used in the best buildings of London." This sort of buncome was bound to dissolve before common sense experience, and, indeed, it shortly came that few buyers discriminated against Canadian woods in matter of quality.

The export timber trade of Canada mounted until in 1825 from the one province of New Brunswick, 400,000 tons of white pine went overseas. During and after the Napoleonic wars, partly because of the disorganization of Baltic trade, and as much from the desire to encourage Colonial commerce and help pay the battle bill, the timber trade between Canada and the United Kingdom grew until Britain, ninety-seven years ago, imported 335,556 loads (a load equal to 50 cubic feet) of timber from British North America, and 166,600 from European countries. This was a most advantageous change from 17 years earlier when only 12,133 loads were provided by Canada, and 280,550 loads from European countries. In the year of Confederation, 1867, Canada had so promoted its lumber industry as to sell to the United Kingdom $6,889,000 worth, and to the United States a bill just nine thousand dollars smaller.

*Canada's White Pine*

As was noted at the beginning of the article, the changes in the lumber industry of Canada since Confederation have been chiefly in respect of extension of volume rather than of evolution of manufacturing methods. It is true that narrowly that period occurred the apotheosis of the square timber trade. Means of quick economical transport by rail have also wonderfully advanced.

More significant, however, has been the striking change in timber values, due to the gradual depletion of once abundant tree species and the growth of population and markets. White pine, so prolifically distributed through Ontario, Quebec and New Brunswick—then, as now intrinsically the most valuable wood we have—has been reduced to rather a poor second to spruce and Douglas fir in the total national cut. It is not to be gainsaid that a great deal more white pine has been delivered to fire than has been turned to commercial purpose. Indeed, the estimate of investigators is that two-thirds of the country's original forest inheritance has been the victim of flames. White pine in New Brunswick does not take better than fifth place in the average season's cut. The words of a Quebec lumberman testify to a like condition farther west. "A boom at my father's mill was practicaliy all white pine, and about five or ten per cent. spruce. To-day the proportions have been reversed." Ontario alone maintains its white pine preponderance year by year.

Our most valuable hardwoods also have suffered. Standing as they did on the agricultural soils of southern Quebec and Ontario, the advance of settlement took small account of future market prices for oak, elm, or walnut. We are, as a consequence, importing most of our precious hardwoods to-day from the United States, and the college building or residence of recent construction will as often as not exhibit oak pannelling supplied from Uncle Sam's forests.

Hemlock, too, has supplied another lesson on the necessity of guarding resources for future values. Hemlock in Canada had for long years a trifling value as a source of tan bark. As might be expected, the hemlock supplies of the country went the prodigal way of white pine until now operators are offering prices that a few years ago would have seemed quixotic.

Spruce has become king of the castle. Spruce, white pine, and Douglas fir account for 75 per cent. of the total annual cut, which in 1915 ran to 3¼ billion feet, board measure, worth $61,919,806. Hardwoods represented only about 6 per cent. Over 3 billion shingles are produced yearly, worth about $6,000,000.

### *Forest Wealth by Provinces*

Just as the most important fact in the nickel industry of Canada is the extent of nickel deposits, similarly the lumber industry must be viewed in the light of the living forests. Canada's timber resources are the third largest in the world, ranking after those of Russia and the United States. The estimated present supply of commercial timber, according to the Dominion Director of Forestry, is 500 to 800 billion feet, not an 'inexhaustible' quantity when we consider that we are using three and a quarter billion feet a year, and with the population of 1950 will probably multiply the annual consumption several times. The area of 'commercial forest' (not including pulp wood, fire wood, etc., is) reckoned at about 250,000,000 acres, or one half the whole forested area of the Dominion.

British Columbia, with 50 million acres, containing 350 billion feet, board measure, has more large saw timber than any other province. Douglas fir accounted in 1915 for more than two-thirds of the total lumber cut of the province, with red cedar, spruce, yellow pine, larch, etc., varying from 8 per cent. downward. The bulk of the best timber is in the Coast region.

Alberta has about 5,400,000 acres of commercial saw timber amounting to 21 billion board feet, spruce forming the bulk of the annual cut. Saskatchewan timber area is 3,584,000 acres, the contents of which are about 14 billion feet, spruce being the prevalent commercial wood. In Manitoba 1,920,000 acres of saw timber contain about 6,850,000 feet of timber, and of the annual cut of lumber in 1915, spruce formed 93 per cent.

Ontario, accessible to the richest markets of the continent and endowed with excellent transportation facilities from the log to the finished

product, placed a value of about $21,000,000 yearly upon its lumber, lath and shingle production in 1915. Its productive forest areas are from 70 to 90 millions of acres containing approximately 150 billion feet of merchantable timber. White pine, spruce, red pine, jack pine, balsam, fir, tamarack, hemlock, white cedar and hardwoods are present, for the greater part in abundance. In 1915 white pine formed 60 per cent. of the timber cut, hemlock over 10 per cent., red pine 10 per cent. spruce 8 per cent., maple, elm, and twenty other species the remaining 12 per cent.

Quebec contains about 80 to 100 million acres of merchantable saw timber, the coniferous species being about the same as in Ontario. The value of the 1915 lumber, lath and shingle production was $19,196,000. Estimates place Quebec's saw timber at about 160 billion feet. Quebe 's white pine represents 15 per cent. of the total cut against Ontario's 60 per cent. while spruce in Ontario was but 8 per cent. of the total cut as against 55 per cent. in Quebec. The claim is sometimes made that the two provinces have approximately the same values in white pine, although statistical proof is largely lacking.

New Brunswick's forest area is a little over 12,000,000 acres with standing timber of about 22 billion feet, spruce being the wood of greatest utilization. Nova Scotia has about 10 billion feet of timber covering more than 5,700,000 acres, the tree species differing little from those of New Brunswick.

### *Canada's Future as a Producer of Wood*

As to the future of the lumber industry in Canada, few can doubt that with better trade organization, with aggressive sales methods to meet the increasing inroads of wood substitutes, and the searching out and cultivating of markets—with these elements of efficiency and balance more fully developed, the lumber industry will have an open road to great expansion and prosperity. To particularize on such an experience as that of British Columbia lumber trade during the past three years merely re-states the need for better trade organization, and adequate transportation facilities to take care not only of foreign export orders, but the demands from the prairies as well. Similar remedies are called for in the East as in British Columbia.

While export orders of British Columbia timbers to Australia, New Zealand and South Africa have been steadily mounting, the evidence of H. R. MacMillan, former Timber Trade Commissioner for Canada, who recently visited the Antipodes, is that so firmly established in public favor are timber from the Baltic states and from the United States that Canada must exert prodigious effort to take her place as a serious competitor, although the war has opened the door for valued introductions. At present, British Columbia woods are practically unknown by name in many of the markets and sometimes grossly underestimated as to quality and adaptability.

### *What Canada Expects*

In total exports of sawn lumber, the country now ranks well up to fourth place in the list of all nations. We send beyond our borders about forty-three million dollars worth a year. About $10,000,000 of that amount goes yearly to the United Kingdom. Exports of wood in all its forms of manufacture (including pulp and paper) were valued at $62,000,000 for the year ending March 31st, 1916. While many lumbermen anticipate a great demand for lumber from the United Kingdom. France, and Belgium after the war, the comparative distances of Baltic and Canadian sources of wood supply have tempered the expectations of others, for the average freight rate from Baltic ports to England is 1½d. as against 4d. from Canadian ports.

The United States lumberman is, to an unrecognized degree, the arbiter of the Canadian price. One may study the barometer of United States lumber production and see at every occasion when production overtops home consumption, or when the mag-

net of Canadian demand shows extra vim, the American mill hurries cargoes across the border. Canadian prices must meet the competition, and do. A quiet home demand in Canada and keen trade openings in the United States will, in turn, find the Canadian lumberman bidding in Uncle Sam's home towns. In this way the meeting line of Canadian and American competition swings from side to side of the international boundary. How this works out is seen in the United States sales to Canada of lumber and shingles amounting in 1915 to $6,741,000 and reaching as high as $14,328,000 in 1913. In the former year Canada sold to the States lumber and shingles valued at $22,279,891. The total value of the Canadian lumber and shingle production in 1915 was $69,750,000.

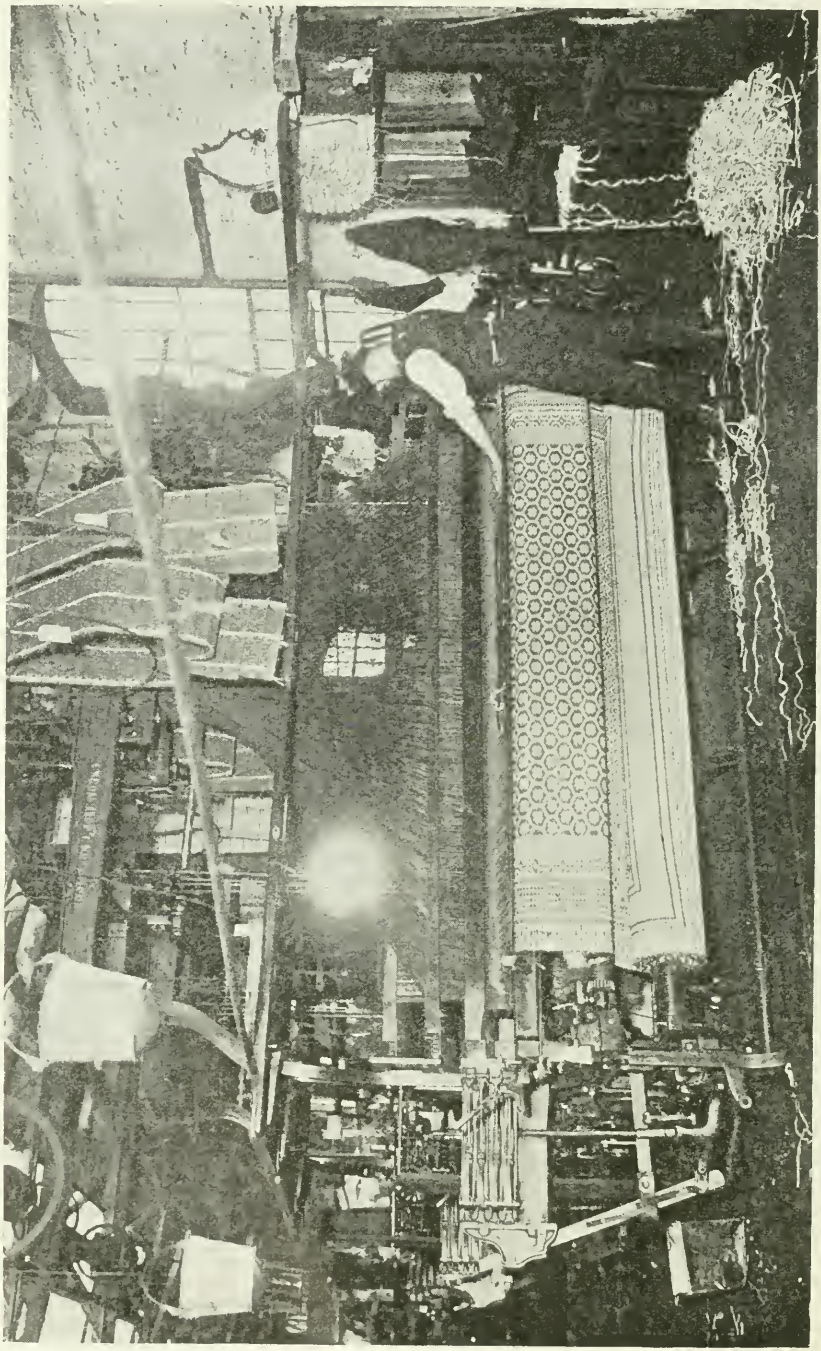
The growth of Canadian agricultural population and the opening up of new districts, building of new farms, homes, and towns, and the parallel development of manufacturing industries, will give a great and steady impetus to the lumber demand. We North Americans are the greatest wood users on earth, consuming six or seven times the amount per capita of the European. Our rapid expansion of 'plant' accounts only in part for this large discrepancy. Wood in all its forms is a world staple, the variety of uses for which are only now being unfolded by scientific experimentation. It is not too much to predict that within a very few years a wide commercial use will be found for practically every tree species found in Canada and that what is now termed a superfluity of poplar or jack pine, for example, will be counted in with the other rich assets of the timbered areas.

### *Canada Has Been Careless*

There is no reason to doubt that the present status of the lumber industry in Eastern Canada has been very materially affected by the country-wide neglect of forest preservation measures. Costs of getting out logs have risen steadily with the growing inaccessibility of the forest. That this distancing of the wood supply has been due first to forest fires, few lumbermen will dispute. That the methods of woods operations have not been such as to perpetuate tree growth of the more valuable species on lands cut over, is another factor equally applicable but not as commonly admitted. Economy and efficiency have tightened up the system at the mill end, while as a rule the methods at the woods end have not changed essentially in generations.

The more advanced lumbermen, and particularly pulp mill operators have long been cognizant of the deterioration of lumbered-over tracts, knowing well that if the lands on which the axe has fallen do not fully recuperate, as under present cutting methods they do not, every year brings the industry and the whole nation closer to timber exhaustion. This question of proper cutting regulations and rigid enforcement by the governments is sure to constitute one of the major issues to be reckoned with by wood-using industries in the near future.

The fact is entirely obvious that the hope of the lumber trade lies in a perpetual source of raw materials secured as cheaply as possible. Otherwise, Canada's hope of export trade in competition with those foreign nations enforcing scientific care of woodlands will be rendered vain, and the home market will to a greater degree be occupied by a less expensive array of building substitutes, as concrete, steel, and asbestos.



**The loom, a special kind for the purpose, weaves the fibre thread into a durable rug of attractive design.**

# Making Rugs From Paper Fibre

By Sydney A. Bonnaffon in "Commercial American"

## How The Tree Is Turned To Paper Yarn, Then Woven Into Beautiful Designs.

As far back as history will take us the use of a floor covering of some sort has been characteristic of the human race. Even if it has been but the strewing of leaves or grass in cave habitations by the most ancient known representatives of mankind, this desire for comfort or protection underfoot has been a distinctive trait. But, while such carpeting may have been sufficient for the needs of the earliest cave dwellers, it was not long before the use of animal skins as an improvement over the more primitive means came into popularity. And even to the present day the animal skin is used extensively for this purpose, but among the highly civilized peoples the use is for decoration rather than for general utility.

In the days of ancient Greece and Rome the progress of civilization was reflected in a high appreciation of the decorative, and floorings of artificial stone, mosaics of marble, tile and variously colored woods symbolized the wealth and luxury of the times. It was in Rome that the famous textile carpets of Asia, the first recorded, those made by the Egyptians, and the woollen carpets of Babylon, found their sale, and for beauty and durability they have never been rivaled in all the centuries since. Oddly enough, the looms which made those wonderful carpets of antiquity differ in practically no respect from the Oriental hand-looms of to-day, which continue to supply the world's best and most expensive floor coverings.

### *The Carpet-making Art*

These Oriental rugs and carpets of Western Asia early found introduction into European countries. The Moors brought them to Spain during their conquests in that country. Again, the Crusaders to the Holy Land brought them home with them. Italy, because of its proximity to the rug markets, had Oriental rugs long ahead of other modern countries. Before the advent of the textile carpet in Europe tapestries and needlework hangings were occasionally used as carpets, but it was not until the fourteenth century, and in Flanders, that carpet making really had its start. From then on the development of the industry spread rapidly, although the influence of the Oriental article, particularly in the matter of design and colors, was strong, and has continued so up to the present day.

Rugs and carpets, however, despite the modern improved methods of machine weaving and large scale production, have never become what might be termed cheap. Where low price has been desired, quality and consequently utility have had to be sacrificed. Little more than a hundred years ago American housewives considered even the modest home-made rag carpets as a luxury and only to be used in the best room of the house, while in other rooms the floor was left bare, or, as in the much-tenanted kitchen and sitting room, sand was used. Now, however, the living standard has risen, and with it a demand for an attractive as well as a durable and cheap floor covering. In recent years Japanese and Chinese mattings have come to be used as a cheap substitute for carpet. It is not, however, a cheerful winter floor covering, nor can it be considered at all attractive, rather the contrary. Similarly, cocoa matting, made from the fibrous husk of the cocoanut, while durable, is rather a coarse and harsh

floor covering and not popular for inside use. Various other vegetable fibres have been employed in making carpeting, but the product is usually found to be wanting in some respect as far as general use is concerned.

*The Start of Paper Weaving*

Appreciating the widespread need, not only in the United States, but all over the world, for a low-priced carpeting which would be attractive yet durable, William Scholes, a Philadelphian, hit upon the idea of weaving rugs and carpets of paper. After considerable experimenting lasting over several years, Scholes succeeded in perfecting his idea, an all-paper rug, made from strips of tissue paper of various colors, twisted into thread and woven into a compact, heavy mat or fabric. When used as a floor covering this rug was found to be not only attractive in design but durable as well, and very cheap, selling for a half to third the price of ordinary wool carpeting.

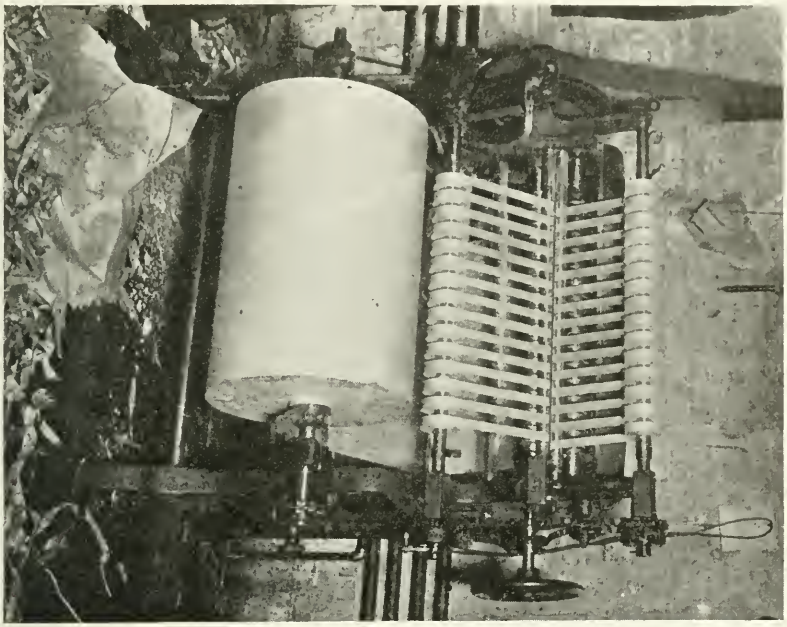
Upon further experimentation it was found that the addition of a little wool brightened up the rug, giving it a rich appearance and also making it easier to sweep. Consequently, the manufacture of both kinds of rugs, the so-called paper-fibre rug and the wool and paper-fibre rug, was taken up, and for a number of years the market has been supplied with them. The fact that the manufacture of this interesting kind of carpeting dates back only a few years, however, explains why many have not as yet become acquainted with the product, although it has made its way to the front rapidly, and in the face of competition by many different floor coverings.

*How the Process Works*

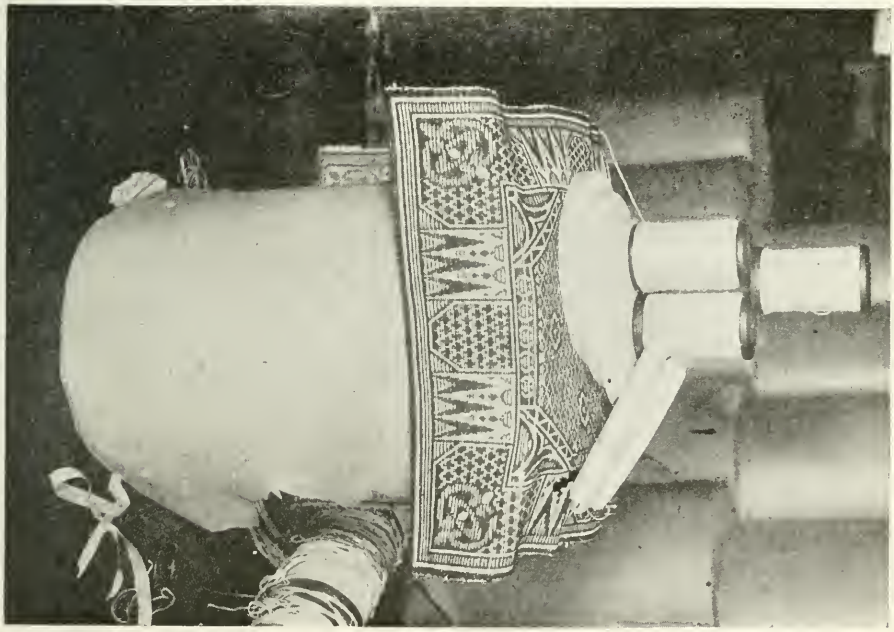
The simplicity of the process of manufacturing the paper-fibre rug has almost as much to do with the low price at which it can be sold as the cheapness of the material of which it is made. For this reason the methods involved in the process of manufacture are interesting. The paper from which the fibre of the rug is to be made is first dyed while it is still in pulp form. The paper makers furnish great jumbo rolls of paper in the colors desired. These rolls of paper measure from two to five feet in length, and weigh as much as seven hundred pounds to the roll. The first step in preparing the paper for rug making is to cut it into strips suitable for twisting into a thread or fibre. This is done on what is called a slitting machine. One large roll of paper will be cut up into thirty or so long strips of widths varying according to the size thread desired—narrow strips for light-weight goods, wider for the heavy. The same machine which slits the paper also rolls it up again, so that a large jumbo roll several feet wide will be cut up into inch or half-inch widths and re-rolled, but of the same thickness as the original roll. This done, the paper is ready to go through the dampening process, and is stored away in a humidifying room.

When the paper has been in this room three or four days it is ready to go to the spinning frames. Another humidifier here assures the proper action of the paper during the spinning. As the strips of paper unroll they go through a twisting process and are then rewound upon large spools. The paper is now in the form of a fibre yarn, the strips which went into the machine flat have now come out a round thread, having a polish and looking like a new piece of straw. The spools upon which the yarn is wound hold about a hundred pounds each. At this juncture the fibre, as far as its manufacture is concerned, is ready to be woven into the rug.

Before this can be done, however, the fibre must be rewound once more so as to permit of its being used on the loom. Here, again, a special machine is required for the work. After the spools have been well filled they are taken from the spinning frames and placed on this machine, which winds them into cops to fit the shuttles of the loom. As in the process of spinning the fibre, female operatives tend the machines, taking



On the Slitting Machine the large roll is cut into widths suitable for weaving the paper thread



From the Roll to the Rug.

care of the process from the humidifying to winding the finished fibre upon the cops ready for the shuttles. Male operatives are, of course, necessary for the heavy work, such as operating the slitting machines and doing the actual weaving upon the looms.

*Coloring the Designs*

The loom for weaving fibre rugs must be of a special kind if the best results are to be obtained. When the loom is ready, and the warps prepared and all drawn in, the design and cards are ready for attention. Here is an important branch of the work as in all carpet weaving. While a design may be very artistic it is necessary to color it with fine shades in order to bring out all its good qualities. Many a good design has been spoiled for the want of good colors to show it up to its best advantage. And it is here that the adaptability of paper to a wide range of colors makes possible the beauty and attractiveness of the paper-fibre rug. After the suitable colors are selected, the loom is ready for actual weaving.

In the process of weaving a wide range of effects is obtained, not only by the use of different designs and colors, but by the introduction of wool for the manufacture of the part wool and part paper or fibre rugs previously referred to. In fact, the manufacturers believe that not only are the wool and fibre rugs highly attractive—it being possible to make up elaborate designs and color combinations—but their wearing qualities are greater in that they will not show the wear nor the dirt as quickly as the all-fibre rug. The wool seems to brighten up the rug, leaving the fibre in the ground for its support. The addition of the small amount of wool, however, does not add to the cost or price of the rug as much as would be supposed, the product still being very cheap compared with the usual prices charged for ordinary textile carpets.

*Sizing the Rug*

After the woven rugs come from the loom, they are run through what is known as a size box containing a mixture suitable for stiffening them and setting the colors more firmly. Leaving the stiffening box, they go over the calenders, several in number, which are filled with steam, and these dry the rugs, making them lie flat on the floor. They are now finished and ready for final inspection before shipment.

In order to supply the demand for the paper-fibre variety of carpeting, manufacturers of the product are now making not only rugs in usual sizes, but also hall runners and bath mats, so that an entire house may be furnished with suitable floor covering of this kind. From bedroom to kitchen and porch there are suitable designs and qualities, differing to suit the needs of each. For example there is probably no better porch rug made for all-around use than a rug of wool and fibre. Particularly is this so because of its absolutely sanitary character under any conditions of weather or climate. It is odorless, creating no smell in damp weather, and it can be washed, scrubbed and otherwise cleaned as desired. Neither rain nor sun hurt it, for in the case of rugs for porch and outside use there is practically nothing to fade.

# Public Meetings in New Brunswick

## Well-attended lectures at Saint John, Fredericton, etc.---Some Urgent Maritime Problems.

A second series of public meetings was held during November in New Brunswick by Mr. Robson Black, Secretary of the Canadian Forestry Association. With the co-operation and hearty assistance of such bodies as the Saint John Board of Trade, the Fredericton Science Club, and leading lumbermen and clubs of other centres, well-attended lectures were delivered. The itinerary included Woodstock, Fredericton, St. Stephen, Saint John, Sackville, Bathurst and Campbellton, and by a most generous co-operation of the leading newspapers verbatim reports of the addresses were spread by means of their columns to most parts of the province.

The Association has added to its equipment for use in these public meetings motion picture films and a portable motion picture machine. These are in addition to an excellent stereopticon equipped to 'dissolve' pictures on the screen in full colors.

### *Public Sentiment*

The difficulties in the way of more advanced forest conservation policies in New Brunswick are of such a nature as to make a persistent educational campaign the key to progress. Generally speaking, the people of the province are not seized of the reasons for a change in old-fashioned public policies aiming to perpetuate the forest supplies. The pleasant superstition of super-abundant forest wealth has been so long accepted as to form a very substantial volume of indifference when forestry subjects are mentioned. This, in turn, has exerted very little pressure on successive administrations at Fredericton. Only in very recent years have thinking citizens in large numbers awakened to the serious peril facing the whole economic structure of New Brunswick, should the forests fail. That the forests actually are failing has been forced upon the realization of the most casual onlooker. The yield per square mile, the quality of the yield, have both been running down hill. Good timber becomes increasingly inaccessible. The farther the Forest Survey goes, the lower becomes the average rate of yield, the greater becomes the percentage of relatively barren timberlands. New Brunswick's position as relates to her forest supplies is grave enough to cause every lumberman, every jobber, every townsman, to hold up both hands for an immediate application of conservative woods methods under the supervision of competent government officers.

Happily, the Forest Survey and Land Classification, instituted by the late Government, is being continued at full swing by the Foster administration, the new Minister in charge of forests, Dr. E. A. Smith, giving to the Forestry Division the most thorough support and encouragement.

### *Fire Protection Reforms*

At the next session of the Legislature, it will not be unreasonable to look for a revision of the whole fire ranging system of the province, substituting for the system of County Wardens (efficient in spots) a centralized organization under command of the Provincial Forester, Mr. Prince. This will go far to rid the province of forest fire losses, for although New Brunswick has travelled in great good luck during the past few summers, the total timber waste during the past twenty years has been enormous. Settlers' fires are allowed to run in absolute freedom, inviting from day to day a repetition of the

holocausts of North Ontario's Claybelt in 1916 when 220 men, women and children were swallowed up in flames. Last summer, settlers were observed many times piling their slash against standing timber and setting the torch to the debris without either knowledge or care of the consequences. Nothing in New Brunswick's fire laws prevents this criminal conduct, except in two townships. New Brunswick has travelled in good luck, much as did Ontario's Claybelt for many years. One never can mark on the calendar, however, the day when the good luck shall come to an end. Modern forest protection systems are not built upon assumptions of luck, but upon exactness.

*Jobbers and Cutting*

The problem of supervising the cutting done by the jobbers calls insistently for Government action. This winter, a commencement is being made, and the Chief Forester has designated a number of his technical men to supervise the cutting, co-operating as far as possible with the timber scalers whose duties have always included inspection of cutting to see that the regulations are properly carried out. The new force of technical men will act in a supplementary capacity and doubtless will tune up the inspection considerably.

One of the quarters where educational work is very badly needed is in putting a stop to the raids on spruce lands by fake settlers. The Forestry Journal understands that the Government is opposing such efforts successfully, despite strong political pressure. Reference was made to this situation some months ago in the Journal, and the argument offered that the settler who, of his own free choice or as a dummy for an organized group, applies for a homestead knowing it to be non-agricultural land, filled with spruce, is a malefactor and should be treated without mercy. He is a bird-of-passage at best. He never intends to settle and could not on such land if he would. He pays no taxes to the public treasury. No sooner is he located, with a dozen of his fellows, than he besieges the Government for a 'colonization' road and in very many instances forces upon the people that useless expenditure. The "homesteading" of non-agricultural lands by spruce hunters is a patent and dangerous fraud and no local member of the legislature has any business recognizing, let alone advocating, the request of his constituent in such a matter.

*Education from Within*

While the Canadian Forestry Association, through twenty public meetings, the distribution of French and English literature placed in the hands of thousands of New Brunswick citizens and teachers and children, the supply of free lecture sets on forest conservation to the schools and churches, a steady campaign of newspaper and magazine publicity, etc., has endeavored to bring to the doors of the people the plain facts of their present crisis, and to make the Forest Survey better understood, and the reasons for new reforms of forest administration palpable, it might be suggested that an educational branch of the Forestry Division, operated from Fredericton, would prove a valuable accessory to the administrative work now being carried on.

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## CLEARING NORTH COUNTRY

Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines, is advertising for tenders on pulp and other timber in the townships of Idington and Owens on the National Transcontinental in Northern Ontario. A new project is being instituted under which it is proposed to cut strips of four chains wide through the townships, so that each farm ar quarter section will have ten acres of cleared land. The purpose of this new plan of timber clearing is to encourage subsequent "cleared farm" settlement.

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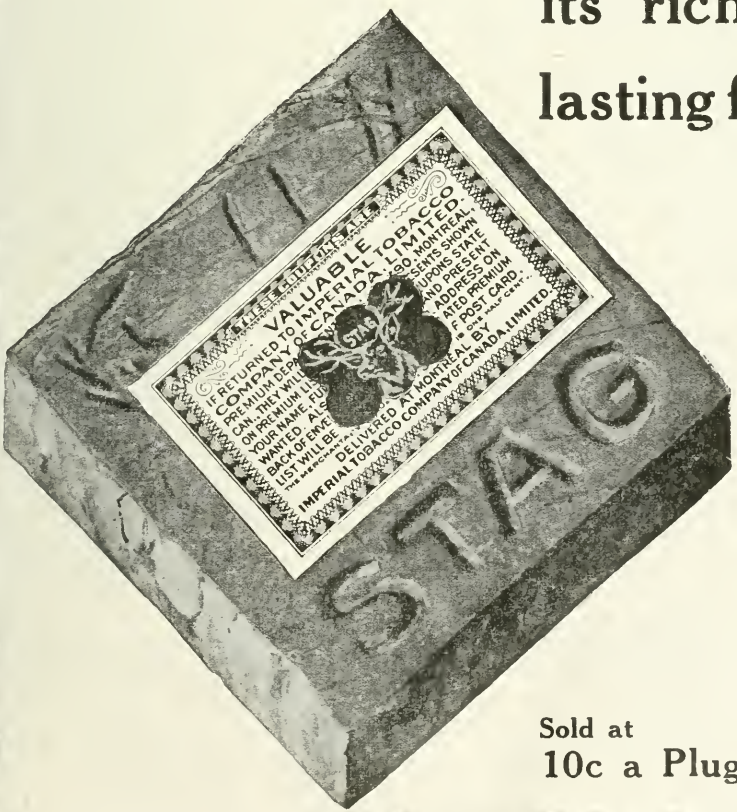
Ontario's wood-working industries use 54 different kinds of wood. Ontario is a great producer of railway ties; more than 5,700,000 were taken out of the forests last year.

# STAG

## CHEWING TOBACCO

*"Ever-lasting-ly Good"*

has thousands and thousands of friends who enjoy daily its rich and lasting flavor

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# THE WORLD OVER

## SPAIN TO ENCOURAGE NATIONAL PARKS

The King of Spain has sanctioned a law concerning the formation of National Parks:—

Under this law all those districts of the national territory shall be known as National Parks which are exceptionally picturesque, wooded or wild, and which are declared to be so by the State for the sole purpose of; faciiitating access to them by suitable roads of communication; causing the natural beauty of the landscape, the wealth of flora and fauna, the geographical and hydrological peculiarities to be respected by protecting them in the most efficacious manner possible against all acts of destruction, deterioration or disfiguration due to the hand of man.

## PORTO RICO'S DESPOILED FORESTS

The island of Porto Rico is very sparsely wooded. The insular and geographical position of the country, its small size, its restricted area of level lands, and its density of population, have occasioned unusual demands on the forests. The same cycle of change is found here as is recorded by civilisation everywhere—the waste and despoilation of the bounties of nature, followed by an acute need for what has been destroyed.

Of the once extensive virgin tropical forest there now remain only isolated remnants in the most mountainous and wind-swept parts of the island. This tract has an aggregate acreage of between 35,000 and 40,000 acres and includes several thousand acres of brushwood. The total area of high forest is scarcely 2 per cent. of the total land area. Part of these forests belongs to the Government. There are, besides, about 400,000 acres classified as "timber and brush lands" and a few thousand acres of mangrove swamps. The total wooded area amounts to approximately 20 per cent. of the total area of the country; but not more than 2-5 of this area is now under forest capable of yielding a wood-product other than charcoal and fuel wood. If now there be added the 168,000 acres in coffee plantations and the 6,500 acres under coconut palms, the total of all lands under forest or brush cover will amount to 27 per cent. of the island.

## THE FRENCH MARKET FOR CANADIAN TIMBER

France consumes, every year, an enormous quantity of all classes of lumber products that Canada can furnish In 1912 French imports in sawn timber and lumber, from countries subject to the same customs tariff as Canada were valued at 200,000,000 francs; in 1913 the amount was even greater. After the war, this demand will increase prodigiously on account of the necessity of building temporary shelters and of re-building destroyed property. It must be remembered that France has retaken from the enemy 753 towns (communes; containing 16,669 houses that must be completely reconstructed and 29,584 that need repairs; it must also be borne in mind that there are now 247 towns on the firing line and 2,554 towns at present occupied by the enemy. This referred to conditions in July, 1916.

In considering the question whether Canada can successfully compete for this trade, it is important to note that she has one incontestable advantage over the United States in enjoying the min mum tariff on manufactured wood, while they pay general tariff. The present supplies are received mostly from United States, Russia, Scandinavia, Switzerland and some through England, but none of these countries have any preference over Canada in custom duties.

# Recollections of Canada's Greatest Forest Fire

An interesting document has come to the attention of the Forestry Journal. It is an authentic description of Canada's most extensive forest fire, that known as the "Miramichi Disaster" in New Brunswick of October 7, 1825. The property damage has been variously estimated from one to twenty millions of dollars, but the loss of life was greatly less than was caused by the Ontario "Claybelt Horror" of 1916.

*A First-hand Description*

Rev. Dr. W. O. Raymond, now residing in British Columbia, quotes a Methodist Minister, Robert Cooney, who passed through the awful experiences of the New Brunswick disaster, in the following picturesque strain:

"The tremendous bellowing became more and more terrific. The earth seemed to stagger as if it had reeled from its ancient foundation. The harmony of creation seemed to have been deranged. Earth, air, sea and sky; all visible creation, seemed to conspire against man and to totter under the weight of some dreadful commission they were charged to execute. The river, tortured into violence by the hurricane, foamed with rage and flung its boiling spray upon the land. The thunder pealed along the vault of heaven; the lightning rent the firmament in pieces. For a moment, and all was still, a deep and awful silence reigned over everything. All nature appeared to be hushed into dumbness, when suddenly a lengthened and sullen roar came booming through the forest and driving a thousand massive and devouring flames before it. Then Newcastle and Douglastown, and the whole northern side of the river, extending from Bartibog to the Nashwaak, a distance of more than a hundred miles in length became enveloped in an immense sheet of flame that spread over 6,000 square miles.

*"The Surges of the River"*

Mr. Cooney continued:—"What shall we say of the tremendous howling of the storm, dashing broken and burning trees and scorching sand and flaming houses through the air? What of the boiling surges of the river and its different tributaries, flinging their maddened foam all round them, and smashing everything that came within their fury? What of the indescribable confusion on board 150 large vessels imminently exposed to danger; many of them frequently on fire, some burning and others burned?

"Even now, the shrieks, screams and cries of a wretched and beggared people involved in ruin, desolation

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and despair, ring their mournful cadences upon the ear. O God, merciful and just! how shuddering were the frantic cries, the wild expressions of horror, and the despairing groans of hundreds upon hundreds of poor homeless creatures, flying from their smoking habitations, they knew not whither, and mingling the thrilling cries of their anguish with the yells, roarings and bellowings of wild beasts and domestic animals perishing by fire and suffocation!"

### *Witnesses Still Living*

Though the Miramichi fire occurred ninety-two years ago there are at least three persons now living who were in New Brunswick at the time, and old enough to remember it.

One of these is Mrs. Vanderbeck, who now lives at Millerton, in the Miramichi district. Her son is postmaster of the village. She saw the fire and distinctly remembers it. Another is William Henry Best of River Glade, Albert County, New Brunswick. Mr. Best will be a hundred years old in January. He "remembers vividly the day when the wind brought the smoke and burned leaves from the north to his home in Kings County."

The third is Mrs. George De Beck, who has lived in this province half a century, but spent the first half and something more in New Brunswick. This lady is now in her 103rd year, and was eleven years old at the time of the Miramichi fire.

### *The Early Forests*

Says Rev. Dr. Raymond:—"The season had been an unusually dry one and forest fires were prevalent. On October 7, 1825, fire from the neighboring woods destroyed about eighty buildings in Fredericton, including the lieutenant-governor's residence. This fire was an offshoot of a conflagration that was raging over a large forest area. On the same day that Fredericton was so severely scourged the fire began to menace the settlements on the Miramichi. Up and down this river the territory was covered by a magnificent forest, which held out the promise of great wealth in coming years, and which even then was contributing nearly half the exports of the Province of New Brunswick. It is estimated that the area swept by the conflagration was not less in extent than five or six thousand square miles. Anyone caught in the forest who could not reach the Miramichi was doomed to die. Most of the settlers' houses between the Miramichi and Fredericton were burned and many lives lost.

### *Towns Wiped Out*

The comparatively small number of inhabitants was the only thing that prevented the disaster from being even more appalling. Newcastle, with two hundred and sixty houses and nearly one thousand inhabitants, was almost totally destroyed; only twelve buildings escaped. Douglastown experienced a like fate, and of seventy buildings only six were left. Moorfields was left in ashes. The settlements in Ludlow were utterly destroyed. Bartibog, Napan and Black River were involved in the common ruin. Sparsely peopled as was the country, the loss of life and property was not inconsiderable. One hundred and sixty people perished, 600 buildings were burned, seventy-five head of cattle were destroyed. The total loss was estimated at 227,714 pounds. But this was not all. Thousands of fur-bearing animals were destroyed. Even the fish in the rivers were killed in large numbers by the fierce heat or poisoned by the alkili of the ashes that fell into the water. Next to human life, perhaps, the most deplorable loss was the destruction of the forest, which represented the growth of ages.

"The year before the fire the quantity of hewn pine timber exported from the River Miramichi was greater than that of the St. John. Thousands of destitute people were glad to share the relief provided by public generosity. The subscriptions amounted to 40,000 pounds, including a donation of 1400 pounds from "His Most Gracious Majesty."

# One Man's Fine Record---Sixty New Members

In the exercise of unselfish and successful service for the promotion of the Canadian Forestry Association's membership, the palm must go once more to Mr. W. J. MacBeth, Lumber Manufacturers' Agent, 60 Brock Avenue, Toronto.

Mr. MacBeth, who regards the work of the Association as practical and far-reaching patriotism, has added no fewer than sixty new members in 1917 by his personal effort.

Last year, he did a similar fine stroke for the Association. Mr. MacBeth is a busy man and probably has as many reasons as any other member for pigeon-holding the "add-a-member" cards sent out occasionally by the Secretary. While carrying on his business, however, he has not failed to speak of the Forestry Association's work to scores of acquaintances and has met remarkably few men who confessed indifference to the subject of forest conservation.

If every member of the Association would take the slight trouble of securing even one recruit, a most valuable service would be done to the country's interests.

# A Gift of 20,000 Socks for Forestry Men

An urgent appeal for assistance in raising a fund of $5,000 has been sent out by the Canadian Lumbermen's Association.

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of socks to the men of the forestry battalions overseas before Christmas, and as the need for socks is reported to be far beyond the supply, this very practical form of Christmas remembrance from Canada has been proposed.

Gifts of any amount, large or small, will be received by Mr. R. G. Cameron, Hon.-Treasurer of the Canadian Lumbermen's Association, Castle Building, Ottawa.

As the bulletin rightly says: "The Canadian overseas with an axe in his hand is doing his bit to win the war."

# *Looking after the Cutting in N.B.*

The following interview recently appeared in the Gleaner of Fredericton, N.B.:

"This is a year of reorganization and the application of scientific method all over the world. Factories and farms, railroads and banks, mines and fisheries have had to get into battalion formation and serve the highest requirements of the State. What works during war will continue into peace. In the keen international contest for trade, only a prompt application by the provincial government of the policy of forest organization and economy can give this province the great advantages to which its wood supplies and water powrrs entitle it. Other countries have read the signs of the times and are harnessing their forests to progressive ideas of protection and operation. Competition will compel action eventually. To act to-day is a matter of business strategy and self preservation.

*Lumbering for all Time*

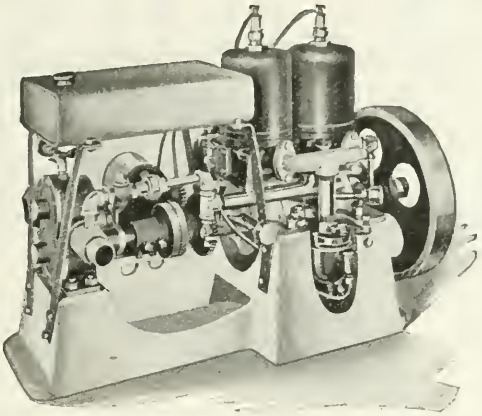
"New Brunswick is essentially a greater lumbering province, not only for to-day but for all time to come. Lumbering is not a way station to agriculture except where the trees grow on agricultural soils. Seventy per cent. of New Brunswick is permanently unfitted for the plow. It will not pay the settler his salt. Obviously the laws of good provincial housekeeping require that not only the tillable but the untillable areas shall render to the public every dollar of profit of which they are capable."

Mr. Black stated that two thirds of Ontario and a larger percentage of Quebec must always be withheld from agriculture because of soil, topographic conditions, or climate. The problem facing all governments was how to keep out fire from the only crop these lands would produce, and how to regulate logging operations so that the supply of trees would suffer no diminution through all time to come.

*Too Much Tree Waste*

"The present methods of unsupervised cutting have brought about a deteriorating forest. From 20 to 30 per cent. of the trees in a given area is left unused, whereas the United States National Forests have reduced this waste to 10 per cent. Except with very few companies in Canada reproduction is left more or less to chance and the chance plays continuously against us. With skilled supervision of the cutting, which is mostly in the hands of jobbers, the present rapid deterioration of timber areas can be arrested and the chief foundation of an enormous industry and of provincial revenues made secure for all time.

"You can burn a candle at both ends but not for long. The forests of Canada are not more than one quarter as extensive as those of the United States, which in turn are outclassed by Russia. Forests cannot survive the double attack of unregulated axe and flame. If New Brunswick's net-work of forest industries is to be maintained and developed, the pillaging of the raw materials by fire must be stopped, and stopped at once."



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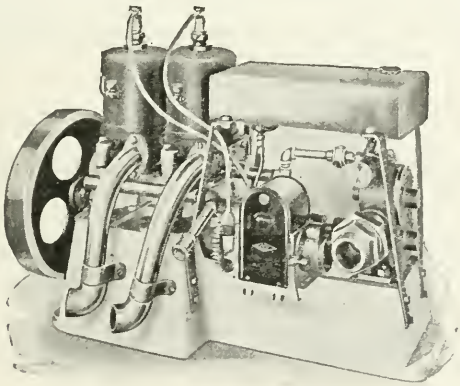

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# Settlers Pay Penalty at Peace River

Under the heading: "Should Be Sternly Dealt With," the Peace River (Alberta) Standard comments as follows upon the laxity of fire laws and enforcement by the Alberta Government:—

"The dire calamity accompanying the prairie and bush fire which has swept across Peace River country from Dunvegan to Bear Lake and beyond is a sad blow to many settlers striving to get upon their feet. The loss of a winter's supply of hay is bad enough, but on top of this is the destruction of millions of acres of pasture, cutting off any possible chance of even stock feeding until the coming of the winter season. The carelessness and negligence of some people in the season of dry grass is positively criminal and such persons should be brought to justice. The aggravating part of it is that even should this be done it cannot restore the hundreds of thousands of dollars worth of property which has been destroyed in one fell stroke."

*Ed. Note.*—This annual hazard could be done away with very largely if the Provincial Government would apply a system of granting permits to all settlers wanting to burn slash in the dangerous seasons and provide for enforcement of strict laws to stop carelessness with fire by whomsoever caused.

# Forestry Instruction for Farmers

In the report of the Ontario Minister of Agriculture there is much interesting information, especially concerning the Junior Farmer Associations and the work of district representatives. One of the former has carried out 46 agricultural experiments; one of the latter has written 29 articles for the papers of his country. The locality is not given in either case, but neither the list of experiments nor the list of articles has any reference to forestry. This might well be included in the literary work of college and school. For the farmer and the embryo-farmer there are a number of forestry problems that are intimately connected with the success of the farm. Perhaps the first problem is to decide whether the wood is to be cleared for planting or maintained as a source of income. The answer to this question involves knowledge of the kind of trees, what they are used for, the sizes demanded and the market conditions and values. Stands of spruce, pine, poplar, maple and mixed hard woods present different phases of the problem. In mixed stands it will

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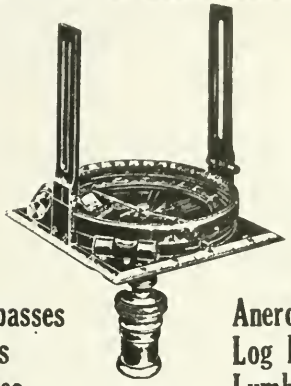

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be a question of what to cut out, and when. An understanding of the elements of proper cutting and lumbering would greatly benefit many a farmer.

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One of the biggest problems in Canada to-day is the disposal of slash and brush. A recent fire in British Columbia raced over an area of timber slash. Whether the fire could have been stopped there if the slash had been properly disposed of is an interesting question. Many serious fires have been started by farmers' brush fires. Permits have relieved this situation very materially. An intelligent farmer is the best safe guard.

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figure low, runs from $15 to $20 per 1,000 feet.

These items of cost tell their own stories of the difficulties encountered in railway transportation and loading. Twelve dollars per 1,000 feet for loading logs on shipboard would sound like a hold-up price in this country, but this loading is done in localities where labor-saving devices are scarce and many difficulties are encountered.

It is pretty much the same story in the matter of railway hauling. Most of the timber is no more than twenty-five miles from the coast, yet often there is a railway charge involved running up to $15 per 1,000 feet. The ocean-going freight is uncommonly high at the present time but the other items of cost are not unusual, and they serve to illustrate graphically why it is mahogany timber is high by the time it reaches the consumer. Perhaps some day we shall be able to introduce more modern methods, and cut down some of these items of cost. Meantime, however, other items involving increased expense will likely accrue, such as having to go further into forests after the timber.

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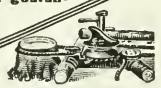

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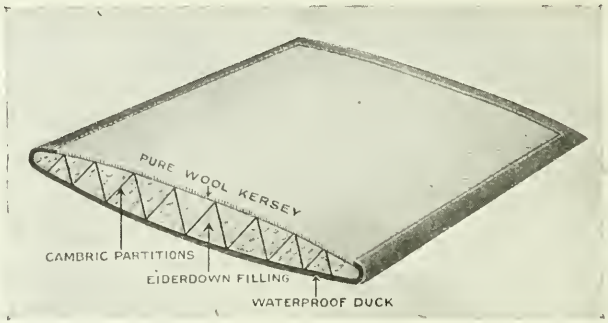


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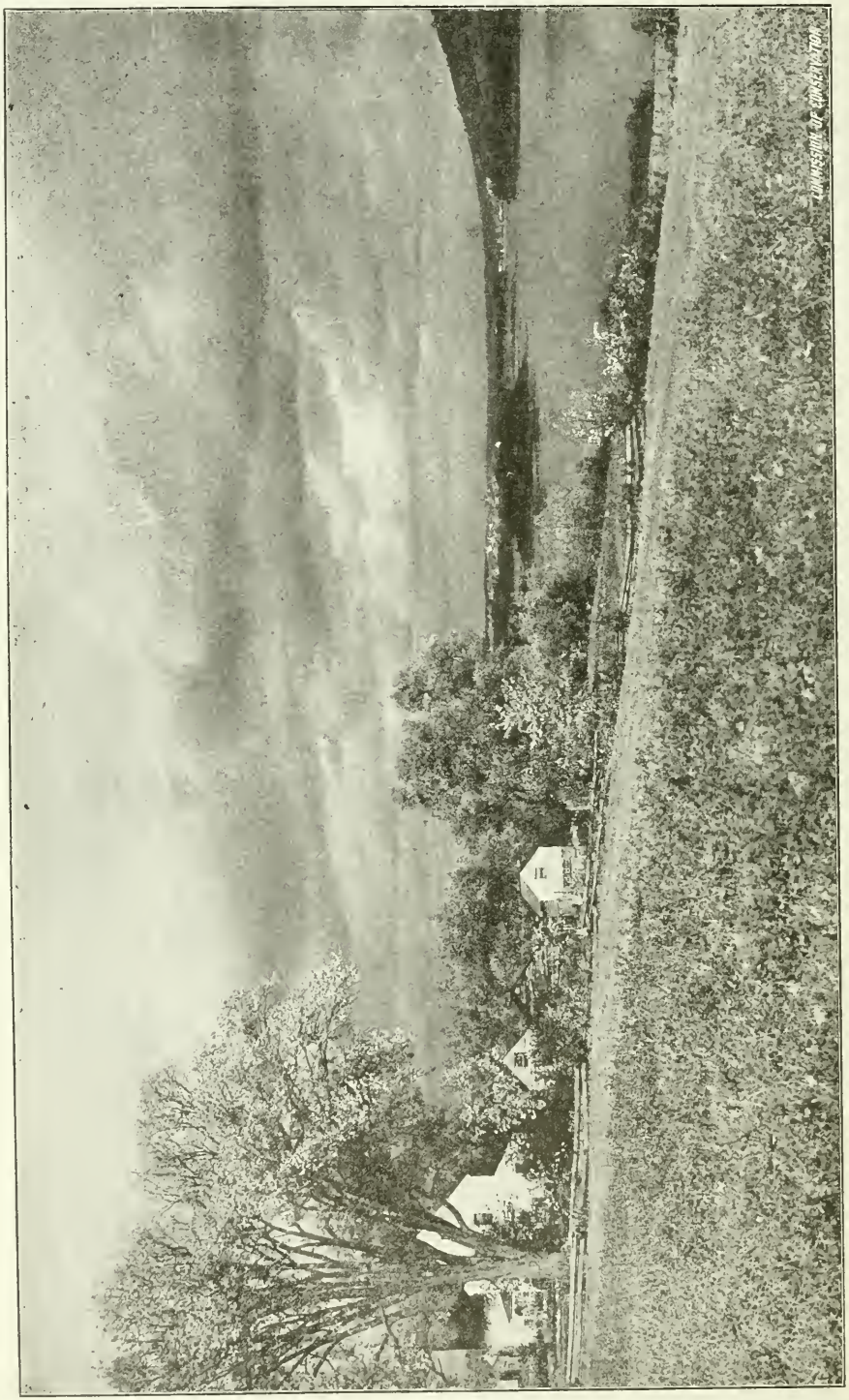


An Eastern Canadian Farm, Where Field and Lake and Wooded Shore Make a Delightful Harmony.

# Guarding Ontario's Northland

By E. J. Zavitz,
Provincial Forester of Ontario.

## Thirty-Five Districts Created, 85 Towers Erected, Over 1000 Rangers Employed.

The Forest Fires Prevention Act passed by the Legislative Assembly of the Province of Ontario in 1917 places the administration of forest fire protection under the Forestry Branch of the Department of Lands, Forests and Mines.

Without going into the details of this new Act it is of interest to point out the new features which are added to Ontario Forest protection. Control of the setting out of fire within forest regions is given through Regulations passed by Order-in-Council. It is necessary between the 15th of April and the 30th of September to obtain a written permit in order to set out fire for the disposal of slash or other debris. This written permit is issued by the fire ranger or other duly authorized official and contains certain restraining conditions. The ranger is given special instructions in reference to the conditions under which the Permit is issued. For example, the ranger may find it advisable to name the exact hour at which burning shall start or that some special protection be provided while burning is being done. The issuance of the permit requires the personal inspection of the ranger.

Another feature of the new Act is the provision for the disposal of fire hazards. Wherever conditions exist which are a menace to life or property the Act provides for definite action by which such danger may be removed.

### *Field Organization*

The forest region of Ontario, subject to the Forest Fire Act, is divided into 35 Districts, each of which is in charge of a Chief Fire Ranger. During the past season we have had 34 Deputy Chiefs assisting the Chief Fire Rangers where areas were large or difficult of access.

The maximum number of rangers for any one period of the past season was 1039.

In addition to the above organization we have had 12 Railway Inspectors, whose duties were to carry out the provisions of Order 107 of the Board of Railway Commissioners for Canada.

For inspection purposes the forest region was divided into three Inspectoral divisions with a Superintendent in charge of each division.

To sum up, during the past season the entire force required in the field, for the carrying on of this work, was 1123 men. You will readily understand that with a territory so large it will require time and experience to work out the most satisfactory field organization.

### 85 *Towers Erected*

Forest fire protection cannot rely alone on the ranger or patrol system. The 1000 men in the field as rangers are helpless if not backed up by modern detection methods.

During the past season the lookout tower on high points has been introduced into nearly all of the districts. The Nepigon Reserve had previously adopted this method and found it a great assistance in the detection of fire. During the past season 85 towers have been built at a cost of over $10,000.00. These towers are permanent structures located so that communication may be had by telephone with outside assistance.

In addition to the permanent tower, rangers are instructed to clean out trails to high vantage points. These observation points frequently command the view over vast areas and are of great assistance in locating fire.

One of the most difficult problems in connection with fire detection is to keep up lines of communication. The look-out tower without communication by wire is of small value. The look-out towers in Nepigon Reserve are tied up to 130 miles of telephone line. We have at present about 200 miles of telephone line available in Forest Reserves. Throughout most of the settlements in the Clay Belt where towers have been built local telephone lines are available. Along some of the railways it will be possible to tie up with the local stations.

This whole question of communication will require special attention. We have not rushed into the construction of telephone lines on a large scale, feeling that more study should be given the problem.

*Reaching and Fighting Fire*

Locating forest fires is a comparatively simple matter. Reaching them in time to take effective measures is the serious problem. In many of our districts the only way of reaching interior fires is by long canoe routes and trails. However, in such districts fire hazards are usually small owing to the inaccessibility of the territory.

Where roads, navigable water or railways make rapid transportation possible there are various methods to be employed which help in solving the problem.

During the past season we have employed three small power boats along the shores of Georgian Bay. We have larger power boats on Lake of the Woods, Winnipeg River, Lake Nepigon and Lake Temagami. In addition to the above seven power boats we have several outboard motors which are primarily intended to assist Chiefs in covering territory where previously they had long canoe routes on the larger waters.

*Using a Fire Boat*

The most efficient arrangement to be made with a power boat is such as we have on Lake Nepigon. The boat remains the major portion of the time at a definite headquarters which can be reached by telephone from the outlying stations and look-outs. This boat is equipped with fire pump and 1000 feet of 1½ inch hose, also other fire fighting equipment and can proceed to a fire with the least possible delay. At present we have three power boats equipped in this manner. On railway lines we have five power motors used for inspection and carrying fire fighting equipment. In patrolling some 80 velocipedes are being used and such mechanical attachments as the Smith motor which are being tested.

Last Spring five motor-trucks were purchased and these are giving good results in the districts where roads are passable.

185 *Canoes in Service*

This organization carries about $100,000 worth of equipment. In addition to blankets, canvas buckets and minor equipment, it was necessary to purchase this season 185 canoes at a cost of $10,000.00; 200 tents at a cost of $3,000.00; 28 new velocipedes at a cost of $1500.00.

One of the problems connected with this work is the overhauling and repairing of equipment and its proper storage. This has required the building of central storehouses. Five storehouses have been built and several others leased temporarily.

*Record of a Busy Season*

Improvement work such as construction of trails, etc., can only be carried out efficiently after the field organization has been perfected. Our organization being less than a year old has much to learn but the following are some of the more important improvements carried out this past Summer.

| | |
|---|---|
| New fire rangers cabins built | 44 |
| New docks or boat landings | 18 |
| Acres of fire hazard burned | 3356 |
| Miles of old trails and canoe routes cleaned out | 1031 |
| Miles of new trails opened | 514 |
| Fire signs posted | 65000 |

In this connection I will refer to the Permit System. Owing to a very wet season in the Temiskaming country this system was not given a severe

trial. Our rangers issued 3886 Permits and no serious opposition was encountered.

**Fire Statistics for 1917.**

*1.* **Number of Fires:—**

| | |
|---|---|
| May | 441 |
| June | 317 |
| July | 152 |
| Aug. | 115 |
| Sept. | 66 |
| Total | 1,091 |

56.1 per cent. did not exceed 5 acres.

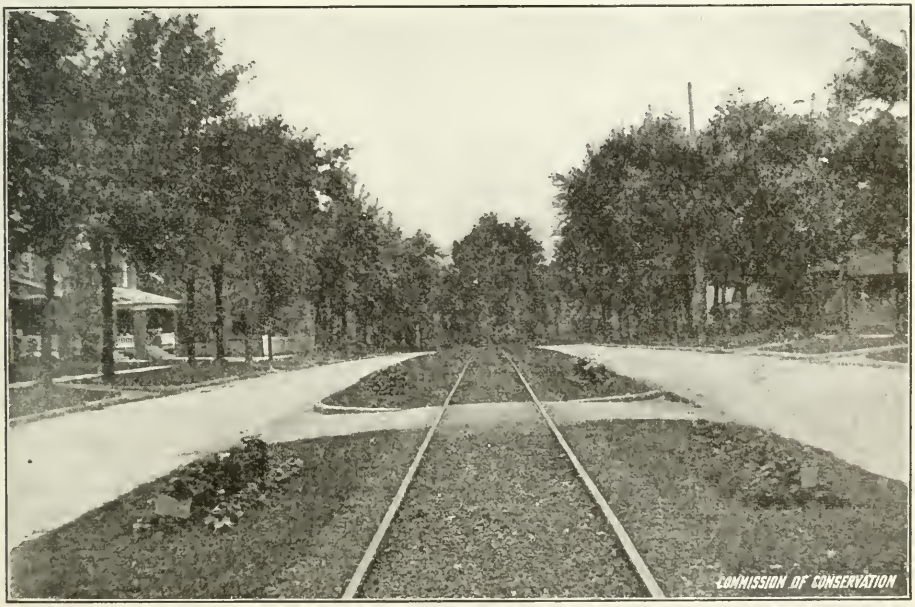
**2. Causes of Fires:—**

| | |
|---|---|
| **Settlers** | *91* |
| **Camp Fires.** | *98* |
| **Railways** | *541* |
| **Lightning** | 28 |
| **Indians** | 54 |
| **Logging Operations** | 45 |
| **Miscellaneous** | 40 |
| **Unknown** | *194* |
| **Total** | *1,091* |

*Areas Burned*

| | |
|---|---|
| 3. Timberland, mainly coniferous, | 71,910 |
| Timberland, mainly hardwood | 110 |
| Cutover, some coniferous timber left | 148,368 |
| Cutover, some hardwood timber left | 2,160 |
| Young growth, mainly coniferous | 60,625 |
| Young growth, mainly hardwood | 13,202 |
| Barren | 82,922 |
| Grassland | 2,332 |
| Total | 381,629 |
| 4. Ft. B. M. | 15,278,000 |
| Cords | 90,446 |
| Ties | 781,685 |
| Posts | 150 |
| Poles | 125 |
| 5. Private property | $2727.00 |

The forest region of Ontario over which our organization has jurisdiction covers an area of over 100,000,000 acres. The greater part of this region is covered with coniferous growth. Large areas have been cut over leaving inflammable slash. Three transcontinental railways pass through this territory over one thousand miles in length opening it to prospector, timber cruiser and scattered settlement bringing in their wake problems of fire protection. Over 4,000 miles of railways cut through this forest region.




**Wilson Avenue, St. Thomas—See Note, page 1458.**

# In The Forests of Siberia

By L. O. Wilgress

Canadian Trade Commissioner, Oomsk, Siberia

## Vast Areas Awaiting Foreign Capital and Enterprise—Government Adheres to Scientific Forestry

The forest wealth of Siberia is a reserve upon which foreign markets will undoubtedly commence to draw in increasing quantities in order to replace the diminishing supplies of timber from other sources. Measures are now being considered whereby the forest resources of this region may be utilized to greater advantage, particularly as regards the development of an export trade abroad in Siberian forest products. The timber trade is regarded as one of the readiest means available for paying off the interest on the public debt of the country and readjusting the balance of trade. This question is of great interest to Canadians, not only in so far as Siberian timber is likely to compete on the United Kingdom and other markets with the products of Canadian industry, but also by reason of the opportunity which will be presented to Canadian manufacturers for the supply of machinery of various kinds.

### *Much of Siberia Unknown*

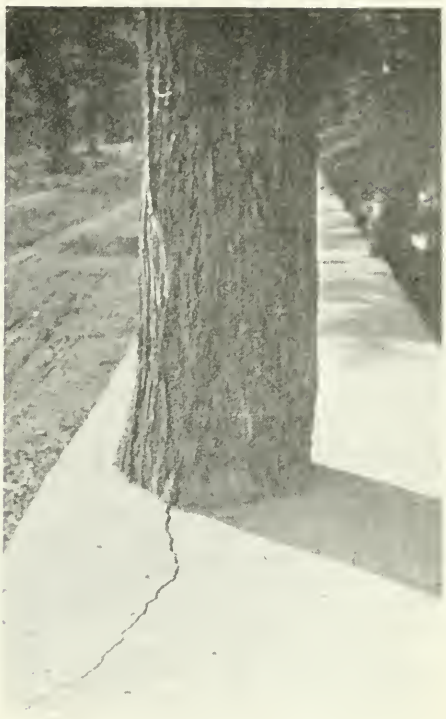
The forest area of Asiatic Russia has been roughly estimated at 853,000,000 acres. The State owns the bulk of the forests of this region, the area amounting to 642,000,000 acres, of which 39 per cent is classed as rich forest lands. In addition the forest possessions of the Imperial Cabinet have comprised an area of 54,000,000 acres, chiefly in the Altai district. These forest lands will now probably be converted into national property, and more attention devoted to the exploitation of their timber wealth. Large tracts of forest land also belong to the Cossacks, particularly along the Amur river in Eastern Siberia.

The largest forest areas of Asiatic Russia are in the western and eastern regions of Siberia. It is estimated that in that part of Siberia which lies west of lake Baikal there are 465,000,000 acres of virgin forest, and Eastern Siberia, while not so richly endowed, has sufficient timber to supply the requirements of foreign markets for many years to come. A large part of the forest area of Siberia is still unexplored, the resources in number of trees, species and value being unknown. Thus it is estimated that only about a quarter of the whole area had been either wholly or partially investigated by the year 1915. The investigations which have been made, however, have unquestionably established the great value and wealth of these forests, while as regards the exploitation of their timber resources, only a fringe has yet been touched.

### *Future Prospects*

The measures are now being considered whereby the forest resources of Siberia may be exploited to better advantage. For this purpose conferences have been held between those interested in the timber trade and the State departments concerned. It has been realized that in order to increase the timber outputs, a correct system of management of the forests is necessary, together with the organization of the sale of timber. A reliable investigator has stated that with proper exploitation the timber wealth of this region should suffice for the requirements of Western Europe for many generations to come. In order to make possible, however, the shipments abroad of Siberian forest products, a proper organization is required, backed by sufficient capital to enable the adoption of up-to-date extraction methods. An en-

The foreman of this asphalting job thought this was the correct method of surrounding a tree.



In a few weeks the swelling tree commences to lift the pavement. A costly mistake which could easily have been guarded against. Photos taken on Wilton Crescent, Ottawa.

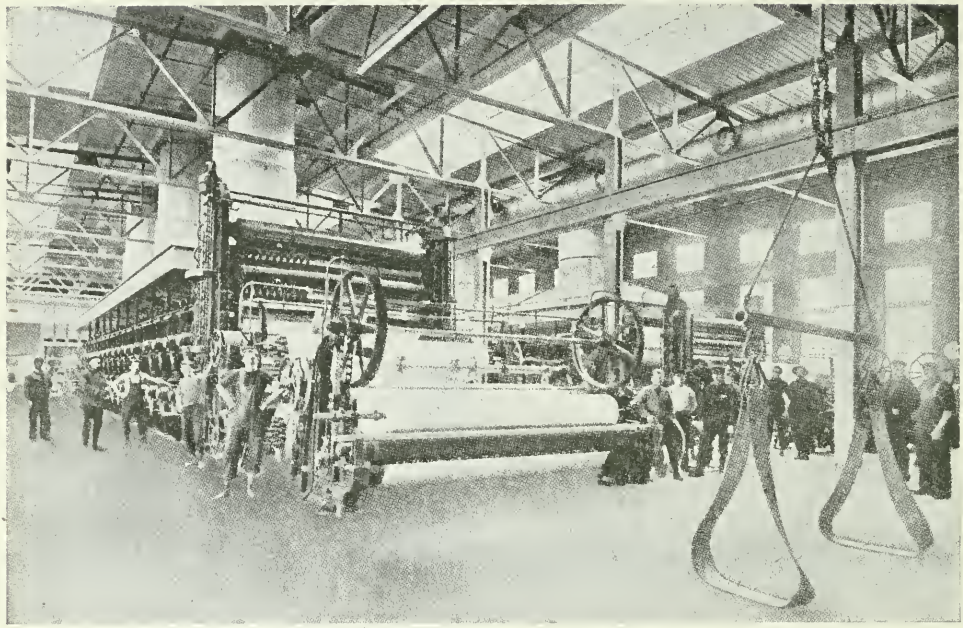
largement of the existing mills and the creation of new saw-mills will also be necessary, as well as the establishment of other industrial concerns using wood as raw material. Closely related to the question of the organization of the sale of timber is the creation of railways and waterways connecting Siberia with the markets of Western Europe.

*Present Methods of Cutting*

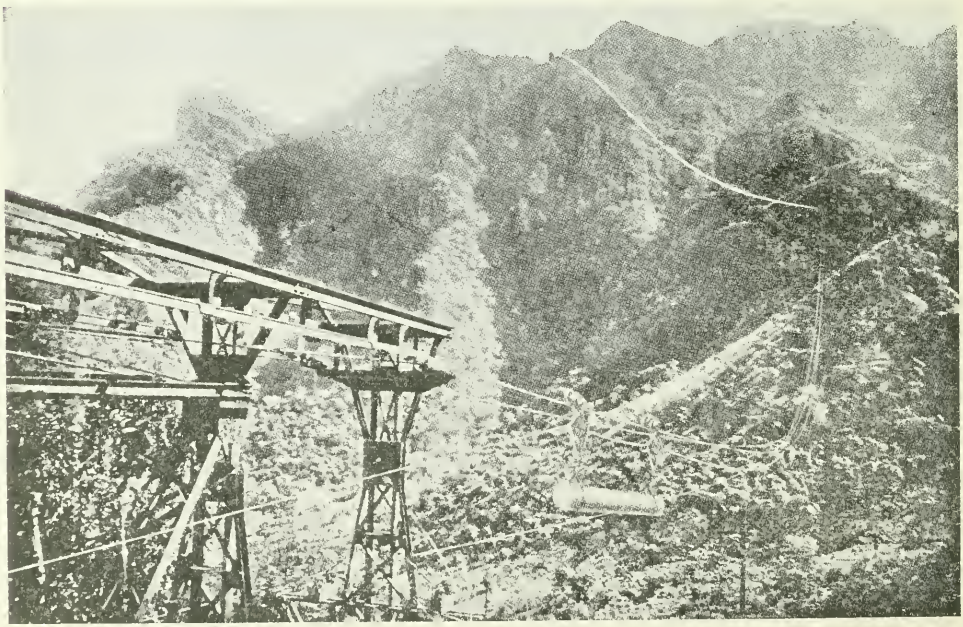
The usual practice in Siberia is to fell trees by hand near the rivers. Up to the present practically no use has been made of up-to-date logging appliances. The logs are hauled to the rivers by horses, a great number of men and horses being required for the work. They are either floated down to the mills by rafts or are brought down on barges. The scarcity and high cost of labour at the present time is directing the attention of timber producers to the question of introducing labour-saving appliances. Inquiries are being made for portable hoisting cranes, while it is probable that a demand could also be created for other logging appliances in use on the American Continent such as cableways, stationary engines, tractors, locomotives, etc.

*State Control Extended*

A plan was adopted before the war for the cutting of timber from the State forests on a large scale. The management of the forest lands belonging to the Government in Siberia has been largely in the hands of the Colonization Department of the Ministry of Agriculture. This department operates several saw-mills and sup-



**Whirling through the paper supply of the London Daily Mail. One of the big machines at the Anglo Newfoundland Development Company.**



**Logging by cable in East Africa. Through this territory the British have gradually driven the German forces until the enormous territory is now officially declared 'free of the enemy.'**

plies the peasants and newly arrived immigrants with building materials and other wood products which they require. Although the future position is uncertain, it is probable that the Colonization Department will take over the forest lands which hitherto have been under the control of the Imperial Cabinet. Little has been done up to the present for the exploitation of the timber wealth of these lands.

# Forest Strength and Fighting Strength

By Dr. J. W. Toumey, Dean of Yale Forest School

The strength of Germany in the present war has to a large measure been due to her vast reserves of forest capital. If France had not had a forest capital adequate to supply the numerous needs of her vast armies, the powers of central Europe would be in Paris to-day.

*Forests For Defence*

The world has discovered in this war that forests are necessary for national defence as well as necessary for industrial development and progress.

No country in its progress from barbarism and primitive needs to culture and industrial development, has been able to maintain its forests in a productive condition without organized effort and the execution of extensive plans for reforestation.

*Time To Begin Is Now*

Although the immediate future supply of wood in this country is secure without giving special attention to reforestation, it is inevitable that it will be deficient both in quality and amount, if we do not, as a nation and as individuals, give more attention now to reforestation and improvement of second growth. One hundred years hence we do not want to say as England is now saying: "Our idle lands must no longer be left unproductive. We must secure that area of home woods which present day necessities make necessary, which the utilization of our national resources and thrift in all departments of life demand and which our posterity is likely to sorely need." We, the United States, do not want to write these words a hundred years hence. We need not if we begin now to work for the orderly development of the second growth, if we have foresight and sense enough now to plan for the kinds and amounts of timber that we are to cut fifty, seventy-five and a hundred years from now.

*Must Plan Long in Advance*

The protection and development of the second growth ought to be a prominent question in national, state, and communal councils to-day, while we have abundance of wood. A crop that requires from seventy-five to a hundred and twenty-five years to reach economic maturity, must be planned for long in advance.

## MAHOGANY CANOES FOR CANADIAN CAMPAIGNERS

Major John S. Leitch, one of the fire rangers of the Dominion Forestry Branch in Manitoba, who has been overseas from the beginning of the war with the Royal Fusiliers in British East Africa, writes as follows—

"Out in the tropics the majority of rivers can be crossed by a standing jump as it were. Rivers such as Canada has are a great surprise to the tropical man. What canoes are here are dug-outs made by natives out of solid mahogany or teak trees. They take months to make and are very heavy. I have yet to see the first African making a portage with his canoe on his back. Some of these canoes are big enough to take 60 men or 3½ tons of stores."

# *Digging The Grave of "Patronage"*

The avalanche of newspaper condemnation of the patronage system and approval of the Union Government's assurances of its elimination continues in all parts of Canada. Again and again influential dailies and weeklies declare that the interference of the politicians with such technical branches as the Dominion forest service can not again be tolerated. A few excerpts are herewith added to the group published in the November "Journal."

*Abolish It*

"Abolition of patronage," asserts the Vancouver "World," is heartily welcomed in the technical services of the Federal Government departments. One such service is the Dominion Forestry Branch, which undertakes the protection from fire of enormous areas of forest in the Prairie Provinces and in British Columbia.

Since the formation of the Forestry Branch, the greatest handicap on its usefulness has been political interference with appointments to the field services, these services including not only fire ranging and inspection, but the important work designed to supply western farmers with shade trees and shelter belts.

*"Astronomers and Rangers"*

"Very few people in the Dominion would probably be greatly distressed to learn that the royal astronomer knew nothing about astronomy, because it would not affect them a particle, and they regard the whole astronomical department as more or less of a fad," remarks the Toronto "World." "Unfortunately too many people take somewhat the same view of the important forestry work of the Dominion Government. They see no particular harm in any young fellow who wants a vacation being appointed a fire ranger, and some of them probably regard forest protection along the eastern slopes of the Rocky Mountains as more or less unimportant.

The fact is, however, that the forestry service not only guards against fire, but engages in the important tree nursery work designed to provide shade trees for the vast stretches of treeless prairie farms between the Red River and the Rockies. The work done by the men in this department is often technical and always important.

The general public will back up the demand of the Canadian Forestry Association that the civil servants employed in the forestry branch be among the first to be brought under the civil service commission, so that appointments to and promotions in that branch may hereafter be made upon merit, free from political interference.

*"Cut it Out"*

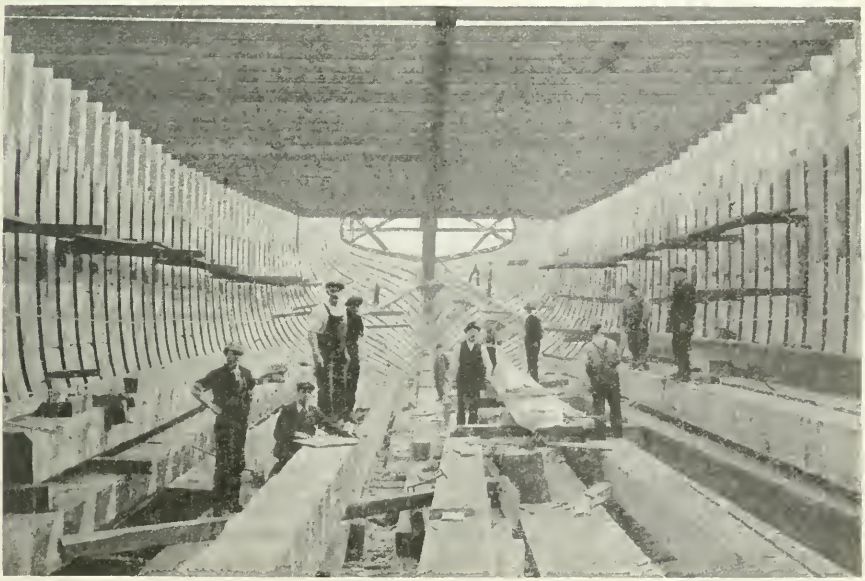
Under the above heading the Halifax Chronicle says in part:

"The Canadian Forestry Association comes forward promptly with the suggestion that a start be made by the abolition of patronage in the matter of appointments in the Outside Service of the Dominion Forestry Branch. . . . It is to be hoped the Government will lose no time in putting its declared policy into operation."

*The Blight of Patronage*

"The abolition of patronage," says "Canadian Finance," Winnipeg, "and the bringing of the outside civil service under the Civil Service Commission had long been urged in Canada, but no mere party government possessed the courage to make the break. . . . Such a responsibility as devolves upon the Dominion Forestry Branch and other technical services ought to be freed with minimum delay from the blight of the patronage business. If there is to be any gradual introduction of the Civil Service merit plan into the "outside services," the technical departments which suffer most gravely are due for first action."

**Shipbuilding in British Columbia.**—Deck view of a wooden schooner during construction.
Courtesy "Canada Lumberman."



**Shipbuilding in British Columbia.**—Looking through the skeleton of one of Canada's new fleet of wooden freighters on the Pacific Coast.

# Studying Forestry in the Forest

## How The Forestry Students of New Brunswick Train Under Woods' Conditions.

One of the interesting forestry enterprises in Eastern Canada is the field work of the Forestry Department of the University of New Brunswick, under Prof. R. B. Miller. This department was inaugurated in 1908 and has enjoyed a steady development with a promise of greater growth in the near future due mainly to the expansion of forestry activities on Crown Lands by the Provincial Government.

Belonging to the University is a tract of about six square miles of timber land. Within the past six years, the value of this tract from two standpoints has begun to be realized—(1) For the production of wood and timber, and (2) as a training ground for forestry students. It should also, as time goes on, possess considerable value as a place for experiment and as a demonstration forest. With these ideas in mind, a beginning at least has been made by the University authorities to protect it from fire and trespass and to so handle it that its value will be enhanced by wise use and judicious cutting.

It is very accessible to market, has two good sized brooks, not drivable, however, and is penetrated in all directions with woods, roads and trails. According to an estimate made in the spring of 1914 by forestry students the land has an acreage in its various classes as follows:—

| | Acres |
|---|---|
| 1. Old clearings and cuttings | 218 |
| 2. Barrens and swamps | 316 |
| 3. Old farms | 490 |
| 4. Growing timber | 2616 |
| Total | 3640 |

### *Helping The Woods Spirit*

When it was first proposed to build a camp the University Senate considered it a doubtful experiment because no camp three miles from town could long survive. However, it still stands and has done more to stimulate the true woods spirit than any

WOOD CUTTING ON COLLEGE LAND

FELLING TREES FOR STEM ANALYSIS

other part of the equipment. It has taken forestry out of the laboratory and the lecture room and established it where it belongs—in the woods.

The building is 16 x 20 feet inside, of peeled spruce and fir logs, chinked with moss. The tar-paper roof has been recently shingled because woodsmen tell us that a camp enters into senile decay at the top and not through the rotting of its timbers. The total cost of the camp, including hardware and floor, was not over $25.00, the work being done entirely by the students. So far it has never housed students for a week or two, but its chief use has been as headquarters for work carried on on Saturdays, being within easy walking distance of the University.

*How The Camp is Used*

The work of the fall term of last year may give some idea of the usefulness of the camp as a center of operations. Juniors were assigned certain 25 acre lots to cruise and make a silvicultural report upon, turning in a topographic and type map of these lots plotted to a scale of five chains to the inch. They had associated with them the lower classmen, five or more men in a party, the Junior directing the work and looking after instruments, etc. Later on in the fall, felling operations started and they were assigned to work in stem analysis of spruce and fir and volume table work on paper birch, following the choppers. If there were not enough trees down, some went to felling and sawing them up into log lengths, others disposing of the brush and slash, until each tree was properly finished. The next Saturday, perhaps, yarding started and some were put to scaling logs as they were piled. When snow comes they assist in the preparation of the hauling roads and by Christmas have had a chance to learn a variety of things about mensuration and logging. Boys from the city are less expert with the axe and saw and are given special opportunity to learn practical things. They are not kept at one kind of work too long, but long enough to learn how it is done.

*Tree Studies*

In the spring, after the snow had

acquired a crust, work was resumed in estimating plots by the sample tree methods, determining growth per cent. of felled trees and sample plots, the data secured being worked up at the office periods. Following out this system of co-ordinating field and office work, most of the subjects in Forest Mensuration could be covered in a year, omitting some of the more complex to come later under management.

At first the camp is a novelty and a chance for a day's outing, but it later becomes more or less of a field laboratory, depending upon the disposition and seriousness of the student. Here students and teacher can meet on a common level and seek from the woods an answer to woods questions. Outside of the mere information imparted, there is the higher and more lasting value of learning to feel at home in the woods and the securing of a proper attitude toward the profession and the ideals for which it stands.

The department has lost heavily through enlistment, about thirty being overseas or in training on this side, so that the loyalty of our foresters cannot be questioned.

## WHAT NEXT?—A "PAPERLESS DAY"?

NO PAPER TO-DAY?
Is that what they say?
No checks, drafts nor notes—
No bills, blanks nor votes.
No letters from folks!
No need for dictation—
No bond in the nation.
No paper Containers,
No legal Retainers,
No paper men fawn,
No waste baskets yawn!
No parcels wrapped up,
No "scraps" for the pup!
No blotters to flout,
No dolls to clip out,
No crisp breakfast flakes,
No Parchment wrapped steaks!
No wrappers for Bread,
No books for the Head.
No files to search through,
Why, there's nothing to do!

Paper is vitally essential to the moral, mental and physical well-being of any but aboriginal people.

And who wants to be an ab-o-rig-i-nee?—From the Parchment Prattler of the Kalamazoo Vegetable Parchment Company.

# *Should Forest Taxes Be Levied on Yield?*

Dealing with the problem of forest taxation, which is fast coming to the fore in Canada, Professor Ralph S. Hosmer, head of the Forestry department at Cornell University, suggests as a remedy "that a tax be laid on the yield, once for all, when the stand is finally harvested. During its period of growth the forest pays no tax under this plan but when it comes to be cut, the owner pays to the state a fair percentage on the yield—5, 10, or 15 per cent. as the case may be. But he knows before hand what to expect and furthermore that he will be subjected to the tax only once, and that at the time when he received his return on the investment. In addition to this tax collected when the timber is cut, this plan includes also a nominal yearly tax on the land itself."

Says Professor Fairchild of Yale University: "The tax on yield has many decided advantages. It avoids the evils of the general property tax. It is equitable and certain. It is in harmony with the peculiarities of the business of forestry and will be a distinct encouragement to the practice of forestry. Its adoption by the states would remove one obstacle to the perpetuation of the nation's forest resources."

# Pulpwood Lands Reforest Slowly

## Optimistic Attitude of Lumbermen and Pulp Limit Holders is Not Justified.

During the past summer, Dr. C. D. Howe, has been engaged, for the Commission of Conservation, upon an investigation of the reproduction and growth of the pulpwood species, after logging, in the St. Maurice valley, Quebec.

This study was initiated as part of a broad investigation to determine what technical measures are necessary to ensure the perpetuation of the vast pulpwood forests of eastern Canada. This project will necessarily require a number of years for completion, since it will be necessary to place parties in the field in other portions of Quebec as well as in typical districts of Ontario. Possibly similar work may later prove feasible in New Brunswick, although the investigations under way in connection with the present forest survey in that province will furnish at least a very considerable portion of the basic information necessary.

### *Hardwoods Dominant*

Dr. Howe's investigation shows that while the coniferous species comprise about two-thirds of the forest numerically, in the section of the St. Maurice valley investigated, the proportion is practically reversed when we consider the relative space occupied in the crown cover by the conifers and hardwoods. That is, the hardwoods monopolize the light to the extent of about two-thirds while the softwoods fill but one-third of the crown cover. Thus, the hardwoods are biologically dominant, and this dominance is constantly being increased by the fact that practically all of the cutting is of the coniferous species, principally spruce and balsam. Practically no utilization of hardwoods has yet been found feasible on account of the heavy loss due to sinking when the logs are driven down the streams and lakes.

This region was first lumbered lightly for white pine squared timber between 50 and 60 years ago; then more closely for white pine and spruce sawlogs about 30 years ago. Since then, practically the whole area has been cut twice and some of it three times for sawlogs or pulpwood or both.

The object of the investigation was to determine the condition of these cut-over lands with respect to the regeneration and rate of growth of the present pulpwood - producing species, namely spruce and balsam, with a view to estimating the future crop.

### *A Comment on Cutting*

**The results of the investigation show that the optimistic attitude of lumbermen and limit holders in regard to the reproducing power of this type of forest is not justified. The good yields of pulpwood material at the end of each of the several cuttings in the past 30 years do not represent the amount of growth accrued during the intervals between cutting periods, but are obtained by cutting successively smaller trees, and in general lower grade material, and also by including a larger proportion of balsam in each cut. For example, the spruce stumps were measured and classified according to the age of the cutting on sample plots, totalling 50 acres, and the results are here stated:**

### *Stumps Grow Smaller*

In cuttings from 15 to 20 years old the average diameter of the stumps was 15 inches; cuttings 10 to 15 years old, 12 inches; while in cuttings less than 10 years old, the average diameter was 11 inches. This shows a reduction of 4 inches in the average

diameter of the trees taken within the past 15 to 20 years. The actual reduction, however, is doubtless greater, since the measurements record the present diameters of the stumps without making allowance for reduction in size by decay in the past two or three decades.

The tallying of the stumps on the sample plots showed the following increase in the proportion of balsam cut for pulpwood.

On areas lumbered earlier than 15 years ago no balsam was cut. In cuttings from 10 to 15 years old, 65 per cent. and 35 per cent. respectively were spruce and balsam. In cuttings five to 10 years old 45 per cent. of the stumps were spruce and 55 per cent. balsam, while in cuttings less than five years old the proportion is 22 per cent. spruce to 78 per cent. balsam.

*Young Trees Present*

So far as numbers are concerned, this culled-over forest is well supplied with young growth of potential pulpwood material. The condition of the average acre is represented in the columns below.

| SPRUCE | |
|---|---|
| Seedlings, trees up to 1 in. diameter | 635 |
| Saplings, 1 in.-4 in. diameter | 99 |
| Poles 4 in.-8 in. diameter | 30 |
| Trees over 8 in. diameter | 6 |
| BALSAM | |
| Seedlings, trees up to 1 in. diameter | 3,972 |
| Saplings 1 in.-4 in. diamter | 161 |
| Poles 4 in.-8 in. diameter | 59 |
| Trees over 8 in. diameter | 6 |

The casual observer is in danger of being misled if he bases his prediction of an abundant future crop of pulpwood upon the number of young spruce and balsam trees beneath the forest. The amount of future pulpwood material and the time of harvesting the crop, depend as well upon the rate of growth exhibited by the young trees now present.

These statements refer to the time required, under the given conditions, to make a merchantable forest from the seedling stage onward. It will be seen from the foregoing table that there are 30 spruce and 59 balsam trees from 4 inches to 8 inches in diameter already present on the average acre. They will furnish another crop of pulpwood material in time, but here again the time is long. The growth tables show that it will require about 70 years for the 4-inch trees and about 50 years for the 8-inch trees to reach the 12-inch diameter limit. The larger balsam however, will be merchantable in 10 years or less.

(*From report of Committee on Forests, Commission of Conservation.*)

## CANADIAN AIRPLANE OUTPUT

The factories operated in Eastern Canada by the Imperial Munitions Board for the manufacture of airplanes now has a monthly output of well over a hundred machines, according to word recently received here. The spruce used in making the airplanes is cut in British Columbia, and a market for a considerable quantity of British Colbumbia Coast spruce, which otherwise might not be used for commercial purposes, has now been found.

## THE FORESTRY PROFESSION

Says "American Forestry" concerning "Forestry as a Profession":

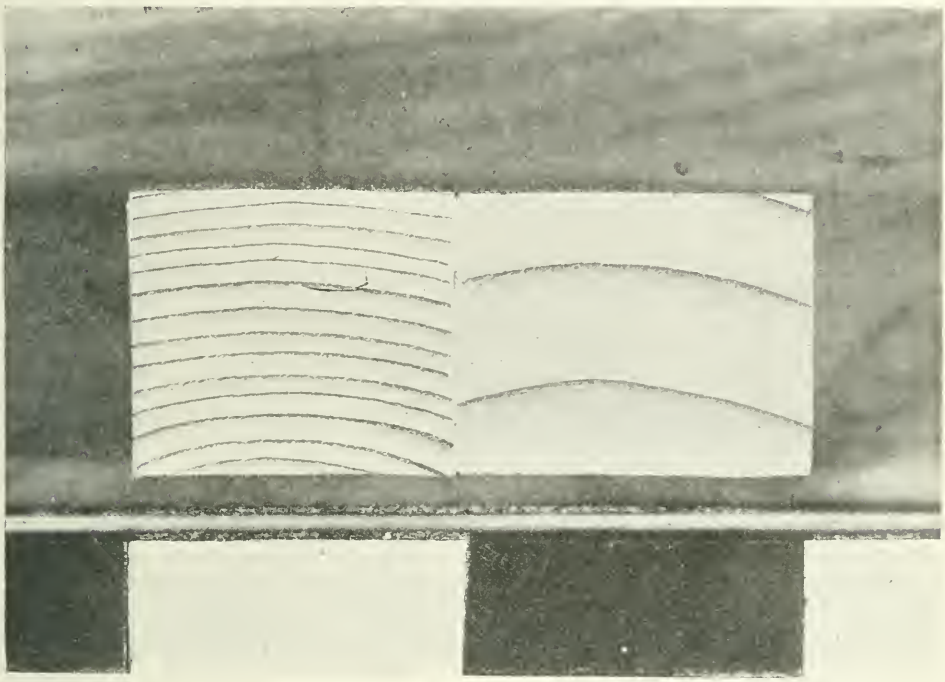
"In Germany a forester cares for about 10,000 acres of forest and usually has two to four assistants. On this scale we would need a body of 50,000 foresters and about 200,000 assistants, besides a large body of specially trained labor, to care for our woods as they should be cared for. To-day not the hundredth part of this number of available men exists in our country.

The American way is not to run after the salesman—the man who has his labor or his goods to offer must hustle and prove his worth.

It is a safe estimate that 10,000 good, capable, honest and industrious men can find employment in the forest work just as fast as they really hustle and prove that they are worth having. And 5,000 more of stronger men can force their way into the forest business and acquire forest property and be their own foresters."

# Fast-Growing White Spruce in Quebec

*Demonstrating the Possibility of Producing Pulpwood in 30 Years.*



(a) Ordinary Growth. (b) Fast Growth.

A piece of ordinary growth white spruce showing almost fourteen annual rings, compared with a piece the same size of rapid growth white spruce from Quebec, showing a little more than two annual rings. Both pieces are magnified two diameters.

A sample of wood recently submitted to the Forest Products Laboratories, Montreal, shows what may be expected of white spruce when it is growing in a favorable position. *The tree from which the sample was taken was* 29 *years old and was* 12 *inches in diameter at* 18 *inches from the ground*, which means that the tree averaged to add almost seven-sixteenths of an inch to its diameter every year of its life. It is interesting to know the effect of such rapid growth on the properties of the wood and the following gives the results of certain determinations together with comparisons with wood of a more usual, slower growth.

The absolutely dry specific gravity is 0.354, which indicates 22.1 pounds per cubic foot. According to recent reports of the U.S. Forest Service, based on determinations of many samples, the average weight per cubic foot of white spruce, absolutely dry, is about 27 pounds. It appears, therefore, that this rapidly grown specimen is about 20 per cent. less in weight per cubic foot than the average white spruce.

Since spruce is the most valuable wood in Canada for sulphite pulp an examination of the length of fibre was made. This showed that in the last year of growth, i.e., 29 years from the pith, the fibre averages 3.45 millimeters in length, and at 19 years from the pith it averages 2.72 millimeters in length. It may here be stated that the fibre ordinarily is longer in each successive year's growth until about 50 annual rings have been formed. Furthermore, at any given number of years from the

pith the fibre is longest at from 10 to 30 feet from the ground and decreases gradually either higher up or lower down. Now for comparison we have figures from ordinary growth white spruce as follows,—in one tree at 3 feet from the ground and 30 years from pith, average length of fibre 2.25 millimeters; in a second tree at 8 feet from the ground and 20 years from the pith 3.01 millimeters, and at 30 years from the pith 3.65 millimeters. Keeping in mind the fact that the fibre in the rapidly grown specimen was taken at only 18 inches from the ground it appears safe, by comparison with the other figures quoted, to state that the fibre in this particular tree averages at least 10 per cent. longer than in the ordinary white spruce.

One may conclude from the results stated above that white spruce, planted in favorable ground and protected from suppression by crowding, will yield trees of good size for pulpwood within 30 years, and although the wood will be slightly lighter than that of slower grown trees, the fibre will be of good length.

H. N. LEE.
Wood Technologist,
Forest Products Laboratories of Canada, Montreal.

# *Turning Timber Orders Towards Canada*

One of the most interesting questions awaiting the close of the war is Canada's future share in the timber market of the British Empire. Already a readjustment is in process whereby it is hoped a larger part of the enormous volume of timber orders given to Russia (60 per cent. of the total requirements) will be turned towards Canada. Readers of the Forestry Journal will be glad to know that the Executive Council of the Imperial Institute in London has constituted an Advisory Committee for Canada. This committee consists of Sir George Perley, K.C.M.G., High Commissioner for Canada,chairman; Sir Robert Kindersley, K.B.E., governor Hudson's Bay Company; J. G. Colmer, C.M.G., former secretary, High Commissioner's office in London; J. H. Plummer, Dominion Steel Corporation, and Sir Keith Price, of the Ministry of Munitions.

One of the most important matters on which action is being taken by the committee is that of the more extensive utilization of Canadian timbers in the United Kingdom. The Imperial Institute Advisory Committee on Timbers has been taking evidence on this subject. Arrangements have been made for a series of practical trials of selected British Columbia timbers to be carried out by H.M. Office of Works, with a view to the inclusion of these timbers in official specifications.

## "SUPPRESS THE PATRONAGE EVIL"

Says Industrial Canada, organ of the Canadian Manufacturers' Association, Toronto:

"That live organization, the Canadian Forestry Association is awake to every opportunity to promote its propaganda, the safeguarding of Canada's forest wealth. Industrial Canada is quite willing to second its plea for more careful and impartial selection of the men on whose efficiency so much depends in the way of conserving our great forest resources."

## A CORRECTION

In the November issue of the Journal an article on the 1917 forest fire losses on the territory of the St. Maurice Forest Protective Association contained the statement that 4367 acres had been burned over "or 61 square miles." Obviously the latter figure ought to have been 6.8 square miles.

# :: The Ghost of the Tree ::

By Holman F. Day, in "Kin o' Ktaadn"

"I have heard some of you woodsmen talk about the ha'nts and the swogans and the witherlicks and the side-hill loungers—says The Stranger. I know these are jokes, my friends, but do you know when I am up here among these trees that are doomed in these days to the grinders of the great paper mills, I feel a queer obsession.

I feel that each tree has a sort of soul,—a spirit in it, and one potent both for tremendous good and tremendous evil.

Strong as the weight of the avalanche,
Yet weak as brook-breathed vapor,
I must obey—but then I sway—
Behold me—I am paper.

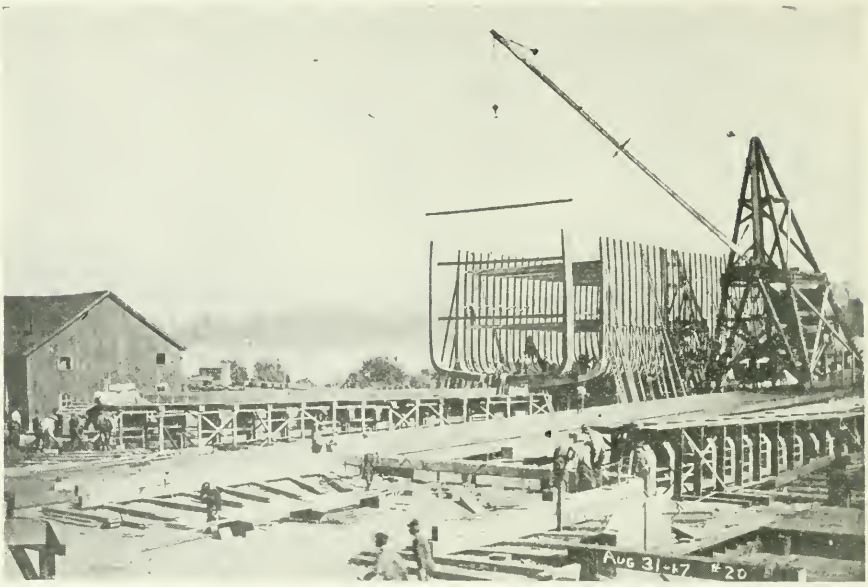
I am ha'nt of the heart of the Tree,
the ghost of the hemlock and spruce,
Phantom of fibre and wraith of the
wood by the axe of the chopper
turned loose.
Cased in the coffining bark long was
I hidden and furled,
But now by the manual magic of men
I carry the news of the world.

I am free—free—free—
I, the soul of the Tree,
Joy and sorrow and terror or smiles—
seek for them all through me.
Fame and name and shame,
To me they are all the same,
I carry them all to the ends of the
earth,
Horror and pleasure and mourning
and mirth,
And to me neither credit nor blame.

I am Paper, I am Paper, pallid spirit
of the spruce,
Summoned far from soughing forests,
patient servant for your use.
They were sent who stormed the
mountains on which, silent and
serene,
Crowding massed the ranks of wood-
land, mighty Army of the Green.
First the woodelves saw with terror
flash and flicker of the axe,
And they watched the steady heaving
of the broad, red-shirted backs;
Then they heard the pulsing chopping
as the axes chocked and chocked,
And they felt the forest's tremor as
the toppling giants rocked.
Then as back and ever backward
were the elves constrained to flee,
On the bark they knocked and whis-
pered: "Wake, O Genii of the
Tree"

I am Paper, I am Paper. Have you
praises or abuse
For the message I am bearing? Look
to them, who set me loose;
Look to them who sent me whirling
through the boiling sluices' jaws,
And to them who held the tree trunks
to the yelling teeth of saws.
Yes, to them who tossed the gobbets
of the sodden, dripping wood
To the slavering, grating, grinder,
grunting neath its iron hood.
For they free from solid fibre might
and spirit of the tree
That in race o'er whirring steam-
drums texture book and form in
Me.
If I wrench your soul with anguish
by the message that I bear,
Look to them who dull my whiteness
—those who spread the poison there.

I am Paper, I am Paper, standing
ready for your call,
White and silent and unspotted; I am
serf and slave to all.
Have you thought or inspiration?
Have you word to send or say
I am waiting, calm and patient, st
your servant and your slave.




Courtesy "Canada Lumberman."

**Shipbuilding in British Columbia.—Placing the frames. Nearby are the keel blocks ready for another ship.**

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Write! What is it, threat or secret,
bargain, pledge, or sale, or boast?
Sign! Ah, mortal, I have bound you!
Mark you well the forest's ghost!
Here I stand and threat and mock
you, shade of promise, debt, or
fraud,
Work and pay or pray for mercy!
You are servant, I am Lord.

I am ha'nt of the heart of the Tree,
the ghost of the hemlock and spruce,
Phantom of fibre and wraith of the
wood by the axe of the chopper set
loose.
Bearing the news of the world, or
message of cheer or of hope.
Binding to bondage of debt or of
shame, or dragging a neck to the
rope;
I, the soul of the Tree,
Hover from sea to sea—
Theirs the fault or theirs the praise
who have helped to set me free.
Fame and name and shame;
To me they are all the same;
They who have dragged me out of
the wood,
Be I for evil, be I for good,—
To them be the credit or blame.

Grim as the weight of the avalanche,
Yet weak as brook-breathed vapor,
I must obey—but then I sway:
Behold me—I am Paper.

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## MUNITIONS BOARD OPENS CAMPS

E. L. Kinman, acting for the Imperial Munitions Board, has purchased a holding of the Merrill-Ring Logging Company at Jackson Bay, B.C. The Board had found great difficulty in securing suitable timber sticks for its shipbuilding programme. The lot purchased carries perhaps the most available stand of exceptionally large fir in British Columbia. It will be logged in full length, the location and ground conditions readily permitting this.

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To get the contents in board feet of a sixteen foot log, measure the top diameter inside the bark in inches, subtract four, square the remainder and add twenty per cent. for the final result.

# Coupling Science to Timber Crops

By G. C. Piche

Chief Forester of Quebec at Inaugural Luncheon of the Woodlands Section of Canadian Pulp and Paper Association, Montreal. . . . .

## Value of Limits Is Not in Area But In Ability to Produce Permanently.

I have always wondered why such a class of men were not taking more care of their forests, why should they bend their efforts only in one direction. It is very sensible to improve your fabrication, but why should you leave your forests, your source of raw material in a bad state: why not apply the same methods of scientific management that you employ successfully in your mill for the production of your timber supply; why leave your forest operations in the hands of your choppers, of your jobbers who have only a precarious interest, instead of employing technical men as you do in your mills. Is this not a lack of foresight, and—if you would be sincere—have not some of you found that the savings made in your mill by your improved methods have been more than wiped out by the increased cost of your wood? Why should the cost of your wood always be on the increasing scale whereas you have succeeded in halting your cost price in your mill, to an almost fixed basis, and then when the cost of labor and supplies follow the same trend on both cases? I know some will object that you are obliged to go further for your logs, that driving is becoming more and more expensive, but why did you not forsee this?

It is becoming a necessity, an imperious want that the paper men will devote some of their energy—to the care and handling of their woodlands. It is obvious that a well defined program should be followed and the work must be systematized if results are desired.

### *A Permanent Forest*

The pulp and paper industry, being established for a long time can afford to manage its forests on a premanent basis, better than any other class of lumberman. Therefore there should not be any hesitation in considering the question from a broad point of view; and though the expenses may seem high in many cases they will often be an addition to the capital of the company just as when you replace a type of screening machine by a more efficient one. The question of depreciation of timber limits is another subject that should be considered broadly—and I am glad to note that at the last enquiry directed by Mr. Pringle this was agitated with good and telling effect for many who ignored it before.

### *The Value of Foresters*

I suppose that you expect me to draft a sort of a program. I feel the necessity of one, and however imperfect it may be, it will pave the way for discussion, for suggestions, and something may come out of it. Naturally the first effort to be made is to secure the proper man to put in charge of your timber lands; without any question this man should be a forester, a man with technical training, and I hope that my friends of the technical section will not dispute me in this matter. You do not go to any plain man for your chemical work, but employ a chemist; for your engineering work you employ a real engineer; why not employ a good forester for your forest work? Some will object that a practical man is needed. This question of practice has always been brought forth by the men who wanted to save their jobs when a better man appeared on the stage. A forester needs practice as much as the chemist, as the engineer, but he does not re-

quire to have grey hairs, he will not be any good then. He will be afraid of going into the woods, his rheumatism will prevent him from plodding all over the works. A forester if given a chance, if employed for the work for which he has trained himself will certainly do good.

*Inventoring Timber*

The next move is to make an inventory of your timberlands. How can you work without this data? You keep a strict account of your stocks of sulphur, of coal, of china clay, of colors; why should you not do the same with your forest? The operations to be conducted in an efficient manner must be directed by the head office according to a working plan and not be carried in a haphazard way as done now. The timber should be cut not only on one river, with the chances of jamming, but on different streams and on several grounds so as to equalize the cost price, instead of allowing it to jump every year. The improvements to be made in the way of portage roads, of depots, of river cleaning, of dams, should be known in advance and a fixed budget prepared every year for the carrying of this class of work.

*Growth Studies*

Studies should be made of the rate of growth of the various species found on your timberlands; so as to know how they should be cut. Investigations of the old lumbered tracts should also be conducted so as to find what have been the results of the lumbering as it was done then. A good deal could be learned this way which would help greatly for drafting plans of lumbering on similar areas. We have begun this work in a few localities, but the province is too large and the interested should have the same studies made for their own benefit.

*Are Our Mills 'Limit Poor'?*

Reforestation is another subject that will require to be looked after. With the increasing cost of labor and supplies, it will become more and more necessary to have a larger yield of raw material per unit of surface; instead of culling on an average 2,000 feet per acre; it will be far more economical to cut in 30-40 years from now 5,000 to 10,000 feet per acre. I claim that most of the paper men are limit poor, as a mill producing 100 tons per day would only require a forest area of 200,000 acres, of 500 square miles, if same was managed to produce wood properly. What an enormous capital is carried uselessly by the companies on account of the fact that their holdings are too poor in timber. I calculate that by adding $1.00 more to the cost price of your wood you could reforest enough land each year to insure you a permanent supply for the future. Naturally the question of time will have to be considered here, but in your plan you can take care of this matter.

*How To Use Hardwoods*

The utilization of the hardwoods is another subject that should be taken into consideration. It may be necessary to modify the present methods of lumbering in order to assure a more complete utilization of all the trees now found on the timber limits but this problem requires an immediate study, and we should all unite to find the solution.

## BURNING WEEDS BY OIL SPRAY

To eliminate growing vegetation from the tracks of the Spokane, Portland, and Seattle Railway during the past summer, an old oil-burning locomotive was equipped with an incinerator and dispatched over the line. The apparatus was designed by the mechanical department of the road and performed efficiently when placed in operation. Fuel oil and steam to atomize it is carried through pipes to a series of six burners mounted a few inches above the rails and just ahead of the leading pony truck. They are arranged in a sheet-iron box that is filled with crushed firebrick and are similar to large blowtorches. To deflect the heat against the roadbed, a large shield, supplied with a water pan, is attached with stay rods to the front of the locomotive and supported close to the track. Back

of the pony trucks there is a sprinkler that is used as a protection for the ties. The engine carries a supply of fuel oil and can cover from 15 to 20 miles a day depending on the density of the vegetation.

A somewhat similar contrivance has been in use on the Canadian Northern western lines.

# Logging Debris—An Imperative Problem

By Ellwood Wilson

Forester of the Laurentide Company, Grand Mere, P. Q.

The next step in forestry progress in Canada will probably be toward the better disposal of logging debris. With the advent of co-operative fire protective associations and the consequent great improvement in the forest fire situation and the greater knowledge of the causes of fires and the means for their prevention, it is being realized that could we economically and practically do away with the slash from logging operations, one of the most serious of the remaining causes of forest fires would be eliminated. A fire once started in a logging slash is practically impossible to extinguish until it reaches an unlogged section or some other barrier. The uncut forest, except in exceptionally dry seasons, does not catch fire readily and the fire, if discovered soon enough, is comparatively easy to put out. In looking over a map of the St. Maurice Valley showing the burnt areas, one sees right away that nearly all the fires have followed logging operations, showing that the debris is a great menace.

### *Top Lopping*

Lopping the tops in our spruce and balsam operations has been proved by actual experiment to cost practically as much as brush burning, and it is only a half-way measure. Where the tops are lopped they rot sooner, but for the first year or two are almost as dangerous as unlopped tops, and fires originating in such areas are almost as difficult to extinguish. Burning the debris is perfectly feasible, even with several feet of snow on the ground, and is very easy in soft wood operations. For two winters, the Forestry Department of the Laurentide Company has been cutting hardwood and all of the debris has been burnt without difficulty. The claim that the additional cost is too great might possibly be true if only one operator burnt his brush, but if such disposal were made compulsory by law, all operators would be on the same footing, and it would be no hardship.

### *A Misleading Idea*

The claim that has often been made that it is cheaper to spend more for fire protection, instead of burning brush, is plausible but fallacious. Even by putting on many more rangers, it is very difficult to keep fires out of slash, and once started, the remaining timber is almost certain to be ruined before the fire is put out. Our dependence for the future is entirely on the uncut forest and the cut-over areas, on which trees below a certain diameter limit and the young growth are left and these must be thoroughly protected. The whole subject is being carefully studied and as fast as the owners of timber lands can be brought to see the necessity of absolute fire protection some practicable law will be formulated.

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The first Pennsylvanian to really appreciate the value of forests was William Penn himself. In 1681 he provided that for every five acres cleared in Pennsylvania, one acre should be left in woods.

# *The Dawn of Science in Lumbering*

By Hugo Winkenwerder

Dean of College of Forestry, University of Washington

Logging and lumbering is not the game it used to be. We still call it a game, but if it is it looks a good deal like a hand in poker when the jackpot holds all your resources and the dealer hands you nothing better than a pair of deuces. It was no trick to make money in the lumber business 20 years ago, but during the last 10 years it took a genius. Logging chances are every year becoming more and more difficult, more efficient, though at the same time more complex machinery is necessary, so that logging is becoming a highly specialized and technical engineering problem; mean and discouraging labor problems, that can no longer be solved through the labor agency, but require a thorough knowledge of economics and human nature and the patience of a divinity for a solution, are constantly bobbing up; more efficient methods in manufacturing have become a necessity; transportation problems are now almost constantly in need of attention; and the marketing problem which didn't exist at all 10 years ago, has, in its war with the substitutes, become one of the most important in the industry. These are only a few of the more important general problems in the ever-growing load the industry has to carry on its shoulders. There is a limit to human capacity, and if these problems are ever to be solved it will have to be done by experts, who have the technical foundation and the time to work them out thoroughly.

*The Forest School Can Help*

You know as well as I do that in looking after the daily routine of your business, both you and your present administrative organization of managers, superintendents and foremen don't have the time to make extended studies on the problems that are in need of investigation, and that it would be done better and much more thoroughly if you had some one with the proper technical training who, working under your general supervision, could give all, or nearly all, of his time to this work. Every other really big industry is doing it. You've got to come to it. Your industry is shouting from the housetops right now for just that kind of thing. Why not make a start immediately? You know that you have a hundred and one problems that you would like to work out, any or all of which may mean greater efficiency resulting in smaller operating costs.

*Technical Questions*

That you will look to the forest schools to supply you with men of sufficient technical training so that you can gradually work them into positions where they will be a help in the solution of these problems is evident from the demands that have been made on the technical schools of other industries and are now being made on the forest schools by the lumber industry. Our work as an information bureau concerning technical questions that arise in the industry has been growing tremendously, and it is a barometer that shows your technical difficulties.

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One of the most expensive woods used in America is boxwood. It sells for about $1,500 per thousand board feet.

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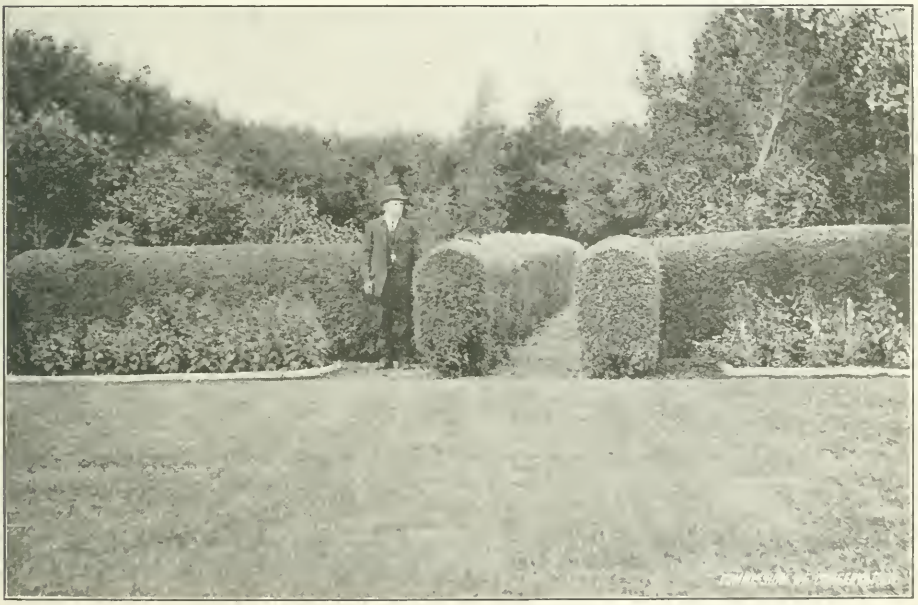
News has reached Ottawa that the son of Mr. E. W. Beckett, Crown Timber Agent at New Westminster, B.C. has been killed in action.

# *How Fast Does a Forest Rebuild Itself?*

The rate of growth of trees in the forest is usually exaggerated greatly.

Dr. C. D. Howe, who during the past summer made a study of the reproduction and growth of the pulpwood species after logging, in the St. Maurice Valley, Quebec, on behalf of the Commission of Conservation, produced the following conclusions:

Over 2,000 trees were analyzed to determine their rate of growth in diameter, height and volume. While the results of this study have not yet been tabulated, they have gone far enough to justify the statement that within the forest type under consideration, it takes about 40 years for the little spruce trees to acquire a diameter of one inch; 100 years to make a six-inch tree, and 150 years to reach the minimum diameter limit of 12 inches established by the cutting regulations in Quebec, for white and black spruce. Balsam grows somewhat faster. A one-inch tree is made in about 16 years, and it takes in the neighborhood of 70 years to reach the Quebec diameter limit of seven inches at two feet from the ground.



PRAIRIE GARDENS, INDIAN HEAD, SASK.

By the provision of trees and shrubs and the encouragement of improved environment round the farms, a means is found to make farm life more attractive.

# Twenty-two Times as Much B. C. Timber Burned as Has Been Put to Use

An astounding proof of heavy forest fire losses in the Province of British Columbia is made public by the Commission of Conservation which has been conducting an investigation of the forest resources of the province during the past four years.

This investigation has shown that on 95,000 square miles—nine times the size of Belgium—the timber has been uselessly destroyed by fire, mostly many years ago.

**The amount of timber so destroyed is estimated to be not less than 650,000,000,000 feet, or about twenty-two times as much as the total that has ever been cut by the lumbermen in that province. Putting the loss in another way, this timber is equivalent to almost twice the amount of saw timber now standing in the province, and to nearly as much saw timber as is now standing in the forests of all Canada.**

**Much of the area burned over contains young forest growth, which, if protected from further destruction, will, in time, furnish the basis for enormous industrial development on our Pacific Coast. If we assume that the 97,000 square miles of cut-over and burned-over lands should be made to produce an average of only 100 board feet per acre per annum, the total increment would amount to 6,200,000,000 feet per year, or about five times the present annual cut. That this estimate is by no means beyond the bounds of reason is shown by measurements of growth which have actually been made.**

The Government and private operators of British Columbia have realized fully the gravity of past losses by forest fires, although probably few were prepared to admit that the situation was as grave as the conclusions of the Commission of Conservation actually show. Happily the provincial forest service is making sure that the annual losses are kept as close to a minimum as the present staff and expenditures allow. This year, for example, the total losses to merchantable timber from forest fires was estimated at $178,401, which is a vast decrease from some of the summers prior to five years ago. At the same time it must be borne in mind that a good many of this year's fires were on areas previously burned over and, therefore, the timber crop was not there to be destroyed.

The total estimated stand of timber in British Columbia to-day—regardless of present commercial value—is placed at approximately three hundred and fifty billion feet.

The commercially valuable timbered area of about eleven million acres is estimated to bear a stand of two-hundred billion feet.

The "Lumber World Review" in issuing "The British Columbia Timber Primer" makes an estimate that five per cent. of the total area of the province bears timber having a present commercial value.

# French Forestry and Canadian Timber Growth

Lt.-Col. J. B. White, woods manager of the Riordan Pulp and Paper Company, Montreal, and for the past two years in charge of forestry work in England and France, stated recently that if yields of 30,000 to 45,000 board feet per acre were frequent in France, as his own investigations had shown, there seemed no reason why Canadians should tolerate the relatively small productivity of timberlands in Eastern Canada where soil and climatic conditions were not dissimilar to those of France. One plot, measured by Col. White, contained 100,000 board feet within an acre. Such a showing did not tend to increase our satisfaction with Canadian lands producing only two to three thousand board feet per acre.

# *A Prophecy on Forest Denudation*

The Journal reproduces the following letter from the Montreal "Gazette" because its authorship commands attention. Mr. William Little of Westmount, P.Q. was to a great degree the founder of the Canadian Forestry Association and has upheld its work with splendid zeal, even now when the weight of advanced years makes itself felt. As a leading lumberman and the son of a lumberman, Mr. Little has evinced a foresight no less noteworthy than his public spirit. Many lumbermen to-day recount Mr. Little's early prophecies of Canadian forest conditions which, while gloomy enough then, have since proved abundantly true.

To the Editor of the Montreal Gazette:

Sir,—If you will refer to the columns of the Gazette of a quarter of a century ago, you will find therein editorials by the Gazette and letters of mine by the score, protesting against the sacrifice of our timber resources in the most reckless manner by our government for the merest trifle of their value, beseeching them to take stock of our white pine and spruce timber before it was too late, only to be ridiculed as visionary alarm ists.

*The End of White Pine*

Now, at last, when our stock of white pine timber is reduced to the mere cullings discarded by previous operations, while in most of our log booms are found about nine spruce logs to every one of pine, and but few of these are over ten inches at the top end, we find that our spruce timber, except that in British Columbia, is in about as deplorable a condition as our white pine, for we are informed by Mr. James White, of the Commission of Conservation, that instead of having, as supposed, material for a supply for fifty years, as reported by cruisers in Eastern Canada and the United States, that about thirteen or fourteen years' supply on this side of the Rocky Mountains would be nearer the limit. And this is the stock we are now to depend on, not only for our home requirements, but to supply the Empire and her Allies that have been robbed of their timber by the German armies that devastated everything wherever traversed by them.

*Spruce Prices Jump*

This scarcity of spruce timber is now becoming evident not only here, but in the New England States, as is shown in the markets of Boston and New York, where spruce timbers that were sold three years ago at from $18 to $20 per thousand feet, are now selling for $40 a thousand feet, board measure, and the smaller spruce timber that was of hardly any value, a few years ago, is now, on account of its great demand for pulp and paper making, considered of almost as much value as common pine, so that the Canadian pulp mills that sold their output of woodpulp at $16.50 per ton in 1914 are selling it now at $42 per ton.

And the spruce wood itself that was sold, f.o.b., cars here only two years ago for from $5 to $6 per cord for unpealed pulpwood, has lately been sold at $15 per cord, for rossed wood on the cars. And a press item states that the pulpwood timber is now getting so scarce in the Adirondack woods that the pulp mills at Watertown, N.Y. State, are paying from $18 to $21 per cord for rossed wood delivered to their mills.

*Effects of The War*

And a glance into the future would indicate that even these prices must be greatly increased when account is taken of the frightful devastation of timber that has already been made in the forests of Europe, notably in Belgium, France, Poland, Eastern Russia, Western Prussia, Austria-Hungary, Italy, Turkey, Greece, Serbia, Bulgaria, Roumania and even in Great Britain and Ireland; and it is known that in all these countries the stumpage value of spruce and fir timber even years before the war far exceeded any price paid for like

stumpage in either the United States or Canada, in many instances fully ten times the amount paid here. One cannot fail to realize that such property must rapidly advance in value when hostilities cease, which cannot very long be deferred.

*How Europe's Forests Pay*

I have a descriptive illustration of a spruce forest in Saxony which shows that the smaller spruce trees there were valued at $15 per cord stumpage, in the woods for pulpwood, and the larger trees were valued at from $25 to $35 per thousand feet, board measure, for lumber. And an illustration of a forest of fir timber in the Vosges, France, planted 100 years ago, that was valued at $1,500 an acre or fully $40 per thousand feet stumpage. And another spruce forest near Oberindorf in the Black Forest, Germany, was valued at $2,500 per acre, which is equal to $50 per thousand feet for the wood crop alone.

Such prices as these for similar timber should admonish us against foolishly sacrificing our spruce timber for one-tenth of its stumpage value as we did our white pine, and as we are now doing with our spruce, or we will soon have only the stumps left, as is the case with our pine, to remind us of our great imprudence.

—WILLIAM LITTLE

November 3, 1917.

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# *Slash Disposal Experiments in Canada*

Specific experiments in slash disposal on the Western Forest Reserves have been so successful that the Dominion Forestry Branch has decided to continue this work and, by means of investigations on larger areas and areas of varied conditions in timber, soil, etc., to develop a policy which will render Canadian forests as free from fire danger, due to the leaving of slash, as European forests are generally considered to be.

The experiments were first conducted under the easiest conditions, namely, in jack-pine timber, on small tracts, in somewhat open and even-aged stands without heavy brush, and on sandy land where the fire could not run easily. The brush was piled while the operation went on and burned later. Spruce forest was chosen for the next experiment, and here also results were satisfactory, even though the litter customary on the forest floor of such forests would seem to offer a dangerous possibility for fire getting beyond control in the burning process. At the outset, caution dictated that the piling of the brush be done by the operators and the burning by the forest rangers. Subsequently, however, both piling and burning were given into the hands of the operators, and it was found that burning immediately after the trees had been cut gave the most satisfaction and proved the safest method.

The cost of this slash disposal varied from 25 to 75 cents per thousand feet board measure, according to the efficiency of the operators after some experience, their spirit of willingness or unwillingness to adopt this new method appearing greatly to influence their efficiency; that is to say, the higher cost was maintained for work done by operators who contended that the experiment would not work, while the lower cost was the result where workers started in with the idea that the work would be done well and quickly.

Not the least of the benefits derived from these experiments is the admission by a majority of the operators that this is the proper method of handling slash to insure protection against fire, some also adding that having the brush out of the way facilitates further operations to such an extent that they regard the cost of its removal as practically nil.—*Journal of Forestry.*

# How Many Logs are Lost by Sinking?

One of the penetrating questions asked of the paper manufacturers of Canada in the course of the Government "probe" into news print paper prices recently has had to do with the percentage of loss due to sinking of logs between the timber limit and the boom. This loss, if determinable, affects the costs of operations and must be included in any thorough-going compilation of production figures.

An interesting reference occurs in the well-known text book, "Logging" by Prof. Ralph Bryant, of Yale Forest School, as follows:

*From 10 to 30 per cent.*

"A very appreciable loss in driving timber is due to sunken and stranded logs. The extent of this loss is dependent on the species driven and the character of the stream.

"Where timber is brought down rough streams, over waterfalls, and past obstructions it is often badly battered and broken, and gravel and sand become imbedded in a large per cent. of the logs. Occasionally they accumulate iron and spikes, especially where iron dogs are used in rafting. Much of this foreign matter is not readily detected, and mills suffer a monetary loss due to damaged saws and time lost by the saw-mill crew.

"The actual loss in log scale from all causes on the Mississippi River drives averages about 10 per cent.; on the Cumberland and Tennessee Rivers in Kentucky, 10 per cent.; in Montana, 10 per cent.; spruce, 5 to 10 per cent. and birch, 3 to 27 per cent. on short drives in the Northeast; hardwoods in Pennsylvania, 25 to 40 per cent.; yellow pine, 20 to 33 per cent. The loss in the Lake States may be as high as 30 per cent. On short drives of coniferous timber the loss is small and may be from zero to 3 per cent. This loss is due largely to sunken and stranded logs and not to the deterioration of sapwood."

*Evidence In Legal Suit*

In the case of James L. Gates, Elliott C. Young, Lumber Inspector of District No. 2, Wisconsin, tried in the courts of LaCrosse, Wisconsin, in 1901, an attempt was made by plaintiff to compel defendant to reimburse him for difference in scale between the "bank" and the boom. During the trial prominent lumbermen from the Black River district testified that "there might and would occur a difference between the woods and mouth scale of from 10 to 30 per cent.

# Winning the Children for Forest Conservation

The scheme of travelling lecture sets, used by the Canadian Forestry Association for the carrying on of its propaganda in many parts of Canada has been developed this winter much beyond the proportions of last year.

Three outfits are now employed, moving from town to town, and bringing the gospel of forest conservation to thousands of adults and children who could not otherwise be reached without heavy expense and an increase of staff.

*What the "Outfits" Are*

These outfits supply from fifty to sixty lantern slides mostly colored, and a readable manuscript, bound in cloth board covers. They are used chiefly by school boards and churches, most of which possess stereopticon equipment. A lecturer is chosen from among the school teachers or local clergymen, whose duty it is to read the introductory story and accompany each lantern slide, as projected upon the screen, with a paragraph of descriptive matter, all

of which is contained in the manuscript supplied free by the Forestry Association.

*Booking the Lectures*

The method of booking these town-to-town lectures may interest members of the Association. An arrangement is first made with the Boards of Education in about twenty towns and cities to use one of the lecture sets. The outfits are so prepared as to carry themselves automatically from place to place. Each is packed in a stout wooden case, in which the individual slides rest in the centre of inch-thick layers of soft felt making breakage almost impossible.

In the inside top of the lid is pasted a route list of the towns and the dates when each must receive the box. A packet of ready-addressed gummed labels is also attached to the inside of the cover. Each recipient is notified by letter a few days before the box is to reach him. He, in turn, is relieved of any trouble in sending the outfit to the next address for he tears off one of the addressed labels, sticks it on the outside of the box and hands the latter to the express agent at the conclusion of the engagement in his community. Each recipient pays the small expressage fee.

Remarkably good results have been secured from the circulation of these lectures. Going direct from town to town, much valuable time is saved and not a little expense. School principals and clergymen and leaders of Boy Scouts have taken up the idea with enthusiasm so that the demand at present is in advance of the three lecture sets.

It will be seen readily that thousands of Canadians are being reached in this way, and have been given an introduction to the subject of forest conservation. The public illustrated lecture cannot be surpassed as a means of implanting ideas and creating a body of permanent opinion.

A few examples of how the Canadian Forestry Association's travelling lecture sets are being used and enjoyed are given herewith:—

At London, Ontario, the Board of Education used one of the outfits as the basis of five evening meetings, held in the schools of the city. The report of the Secretary-Treasurer speaks of the lively interest shown by the senior scholars and their parents and of the entertaining and instructive character of the lecture material. Five meetings in one city from one lecture outfit is indeed a full measure of co-operation.

At Bathurst, New Brunswick, the local moving picture theatre was used to assemble the students of the schools where a Canadian Forestry Association lecture was greatly enjoyed.

At Chatham, N. B. another outfit was utilized before a large audience of children in the assembly hall of Aberdeen School and reports speak of the close attention of all present.

At Brantford, Ontario, Inspector Kilmer reports that "the lecture and views were both very much enjoyed and appreciated by the students and good results will ensue."

**It is estimated that with the three travelling lecture sets at work, the Forestry Association by this means alone is speaking to a minimum of 2000 to 2500 young people every week.**

# National Existence and Forest Maintenance!

By Dr. Bernard E. Fernow

"When the questions of the extension of suffrage to women, of tariff, of taxation, of coinage and currency, which are all merely incidents, will have sunk into the background, the question of the economy of the resources which constitute and sustain the political, commercial, and social power of the nation—long neglected—will still claim attention; for only those nations who develop their natural resources economically, and avoid the waste of that which they produce, can maintain their power or even secure the continuance of their separate existence. A nation may cease to exist as well by the decay of its resources as by the extinction of its patriotic spirit. While we are debating over the best methods of disposing of our wealth, we gradually lose our very capital without even realizing the fact. Whether fertile lands are turned into deserts, forests into waste places, brooks into torrents, rivers changed from means of power and intercourse into means of destruction and desolation—these are questions which concern the material existence itself of society; and since such changes become often irreversible, the damage irremediable, and at the same time the extent of available resources becomes smaller in proportion to population, their consideration is finally much more important than those other questions of the day."

## *White Pine Immune in N. B.*

An interesting meeting was held on the 3rd of December at Fredericton, N.B. when the field staff of the New Brunswick Government Forest Service was addressed by Prof. R. B. Miller, Dean of the School of Forestry, and G. C. Cunningham, in charge of the Dominion Government Plant Pathological laboratory on the White Pine Blister Rust, and by J. H. Tothill, in charge of the Dominion Government Entomological laboratory on the Spruce Bud Moth. Among those present were Col. T. G. Loggie, Deputy Minister of Lands and Mines, A. T. Murchie, Superintendent of Scalers for New Brunswick, and W. E. McMullen of the Crown Land Department. The opinion expressed by those present was that no White Pine Blister Rust has yet been discovered in New Brunswick. Arrangements were made whereby the Forest Service will do scouting this winter under the direction of Mr. Cunningham.

In regard to the Spruce Bud Moth, Mr. Tothill states that as a result of his studies of representative areas for the past five years in New Brunswick, he is of the opinion that the present outbreak is now on the decline. The staff of the Forest Service will also collect data in this regard this winter.

# A New Medium Between Foresters and Woods Managers

Recently at Montreal was launched a "Woodlands Section" of the Canadian Pulp and Paper Association. As expressed in the by-laws the objects shall be "to stimulate interest in more economical and efficient methods of production and utilization of raw materials for pulp, paper and lumber industries; and to provide means for the interchange of ideas amongst its members and to encourage investigation of woodlands problems."

This heralds a movement having the highest import for the wood-using industries of Canada. For altogether too long, the technical forester has been an appendage rather than an integral of Canada's lumber and paper making enterprises. In almost every other department of a paper manufactory than the management of the forests, the technical expert has been accepted as a basic necessity. Now arises a medium, identified with the business control of the industry, whereby the Forester may at last be allowed to place his special knowledge at a company's disposal. This will be achieved very happily by the creation of a sort of common council table at which the problems of the woods departments should come nearer solution.

As knowledge of actual woods conditions ceases to be guess work and becomes scientifically-proved, those responsible for the affairs of great wood-using corporations are coming more and more to realize that the forest management of the past cannot hold the log supply abreast of the mill's necessities, cannot 'make good' the common boast that the timber crops are repeating themselves every thirty or forty years. The more data produced on a forest region, the clearer becomes the conclusion that Eastern Canada's forests are rapidly deteriorating. If this is permitted to continue, the same deterioration will eventually sweep the mill investments to ruin. It is high time, therefore, that the science of woods management was given more scope in actual cutting and logging practice, not by brushing present men and methods to one side but by giving effect to the most reasonable and valuable elements of each.

# Guarding 21 Million Acres

Wherever modern forest protection gets a working chance, it demonstrates its ability to save public and private timber owners an enormous amount of money. The past season was a tricky fire year in the Pacific Northwestern States, producing no fewer than 7,688 fires, of which 938 are given as 'bad' fires.

On regular patrol on the 21,000,000 acres were 2,579 regular rangers and 12,000 extra men were called in to fight fire at various times. The total expended for fire protection was $1,825,000. On the lands of the Western Forestry and Conservation Association, 650 patrolmen extinguished 2388 fires. The loss of timber was very much under previous severe years.

One of the special causes of trouble, is said to have been the activities of the I.W.W. and other pro-German workers, intent upon destroying some of the areas particularly of aeroplane spruce.

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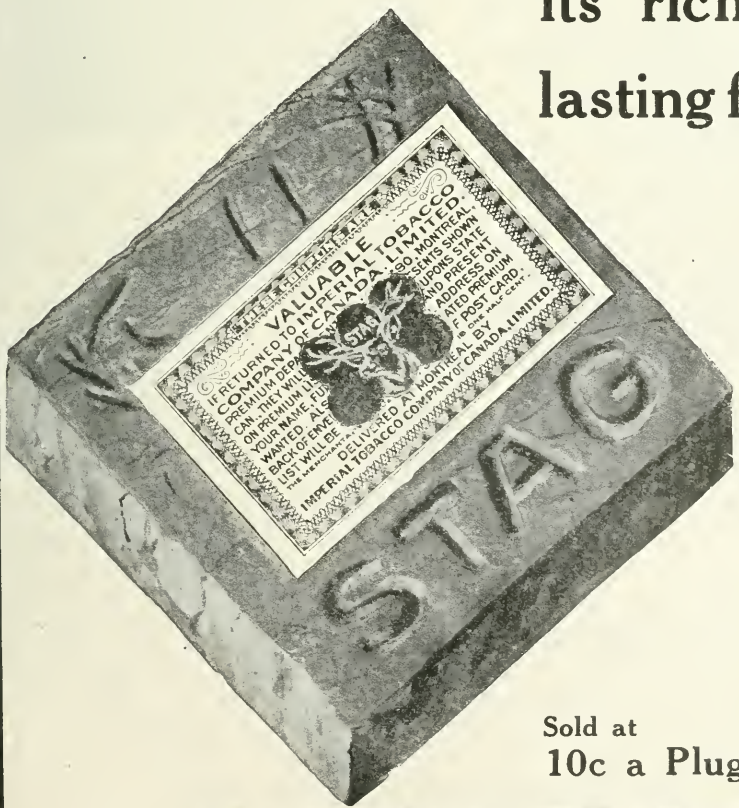


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# *British Columbia's Search for Markets*

With the wealth of forest products this province has to offer to the markets of the world, combined with its geographical location in relation to such markets as South America, Australia, South Africa, India and China, British Columbia should do a large export trade. Some of these markets will take the lower grades which are always produced when high grades are sawn. British Columbia has a large and important market in Canada, but wider markets absorbing all grades will give that stabilizing influence so necessary in the lumber industry to-day. A restricted market dependent on the success or otherwise of a grain crop in one particular part of the world is too uncertain a foundation for a business in so widely applied a staple product as lumber. Therefore, we hope to broaden our business and sell our products in a greater number of markets. We need variety in our markets to absorb all the product of the log. This will enable us to produce more economically with a greater benefit to the consumer.

As a result of a better log market in British Columbia the export of logs in 1916 amounted to but one-half the quantity exported in 1915.

*Pulp and Paper*

In pulp and paper production in British Columbia marked activity has been evident during the whole year. All plants in operation have run continuously, producing a total of 80,000 tons of paper and sulphite wood pulp. Three new companies have commenced operations this year, two of which are already producing, and the third will be doing so in the very near future. Our production of pulp and paper in 1917 will probably be double that of 1916.

In addition to pulp and paper developments on the coast large areas of pulp timber are available in the interior, development of which will undoubtedly be undertaken before long. Many enquiries regarding these are now being received from concerns who are beginning to realize that the last great reserves of pulp timber of the continent are in this province.

To sum up, the experiences of 1917 have shown that notwithstanding great difficulties such as shortage in labor and supplies and the confused railroad situation regarding cars, the Pacific Coast province of Canada is struggling successfully to overcome the handicap of war conditions.—(*Canada Lumberman*).

**Tree 'doctoring' needed on Ottawa's beautiful driveway. A broken stump of a limb has allowed fungus diseases to penetrate the trunk. For lack of attention thousands of fine trees are lost each year by our Canadian municipalities.**

# *Forest Reserves in Burma*

(Dealing with the question of laying down and putting through a strong policy for future reservation with the object of taking in all areas capable of procuring marketable timber that are unsuitable for permanent cultivation and checking the inroads of the taungya-cutter).

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A glance at the map of most forest divisions in Burma shows a number of forest reserves of various sizes, and that these reserves are for the most part more or less remote from the more populous parts.

The chief reason for the former appears to have lain in the suspicious attitude of the authorities to reservation, and, for the latter, to the boundaries being thrown back in deference to the wishes of the villagers.

Moreover, owing to the value of teak overshadowing that of all other species, it is only in recent years that reservation in the interests of the latter has received serious consideration.

In throwing back the boundaries of the reserves in deference to the wishes of the villagers, we certainly have not considered the best interests of the community.

In accessible areas the throwing back of the boundary has resulted, so far as the excluded area was concerned, in the removal of all marketable timber by the trader and the serious depletion of the immature stock by the wasteful use of the villager. Superimpose a trade demand for firewood and areas that were at one time capable of producing marketable timber are in a couple of decades reduced to wastes that are only reclaimable at an enormous outlay.

What the result of excluding forests in deference to the wishes of the villagers has been is emphasized by the fact that it is now necessary to seriously consider the question of forming village forests, that is, within a generation the villagers and traders have squandered the resources of the accessible areas.

*Reserving by Patches.*

The Forest Officer in the past was to a great extent compelled to take too narrow a view, but this view is broadening and the same process of evolution has lessened the suspicions with which the civilian authorities formerly regarded our operations. In the past we were compelled to reserve in patches and to exclude much of the accessible areas.

Should we continue in the future to allow without protest what remains of the unclassed forests to be turned into irreclaimable waste we shall justly lay ourselves open to the reproach of future generations.

As a result of our past policy the less accessible areas are reserved to a great extent and the more accessible steadily deteriorating, though burdened with troublesome regulations, made in a vain effort to stay their ruin and impossible to enforce efficiently.

The only remedy for this state of affairs appears to lie in the reservation

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of all tracts capable of producing timber or fuel.

In carrying out this reservation all lands suitable for permanent cultivation should be excluded and definite areas should be set aside for such communities as must exist by taungya cultivation.

*Communal Forests.*

The settlement might be by townships or any other suitable units and should be carried out on broad-minded lines. To begin with unnecessary bogies, such as that relating to the use of fire in areas unlikely to be brought under fire-protection, should be eliminated from the proclamation. We should also revise our ideas on the subject of what constitute trespass by man and beast and modify the ruling, limiting the exercise of rights to the number of houses actually inhabiting a village at the time of settlement.

The area, within a reasonable radius of habitations, should be reserved for management mainly as communal forests, the original inhabitants getting their produce free, and provision being made for immigrants, being as far as possible provided for at privilege rates. The profit on the management of such communal forests should be utilized for the benefit of the villages in their vicinity.

It should not be considered trespass by man or beast to stray within a reasonable distance of a right of way. Above all the necessity for dealing with unimportant technical offences in a broad-minded way should be impressed on Divisional Forest Officers.—(*Official Bulletin*)

---

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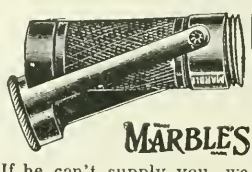

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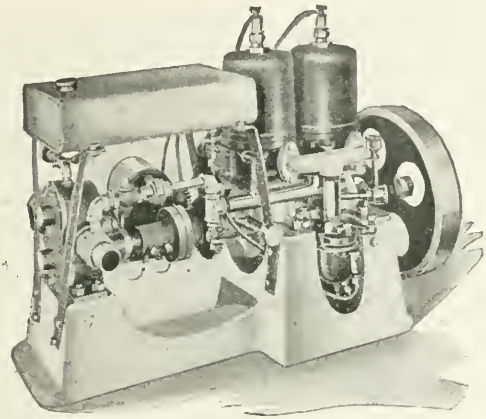

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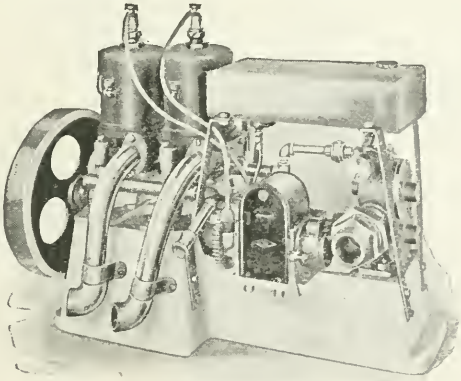

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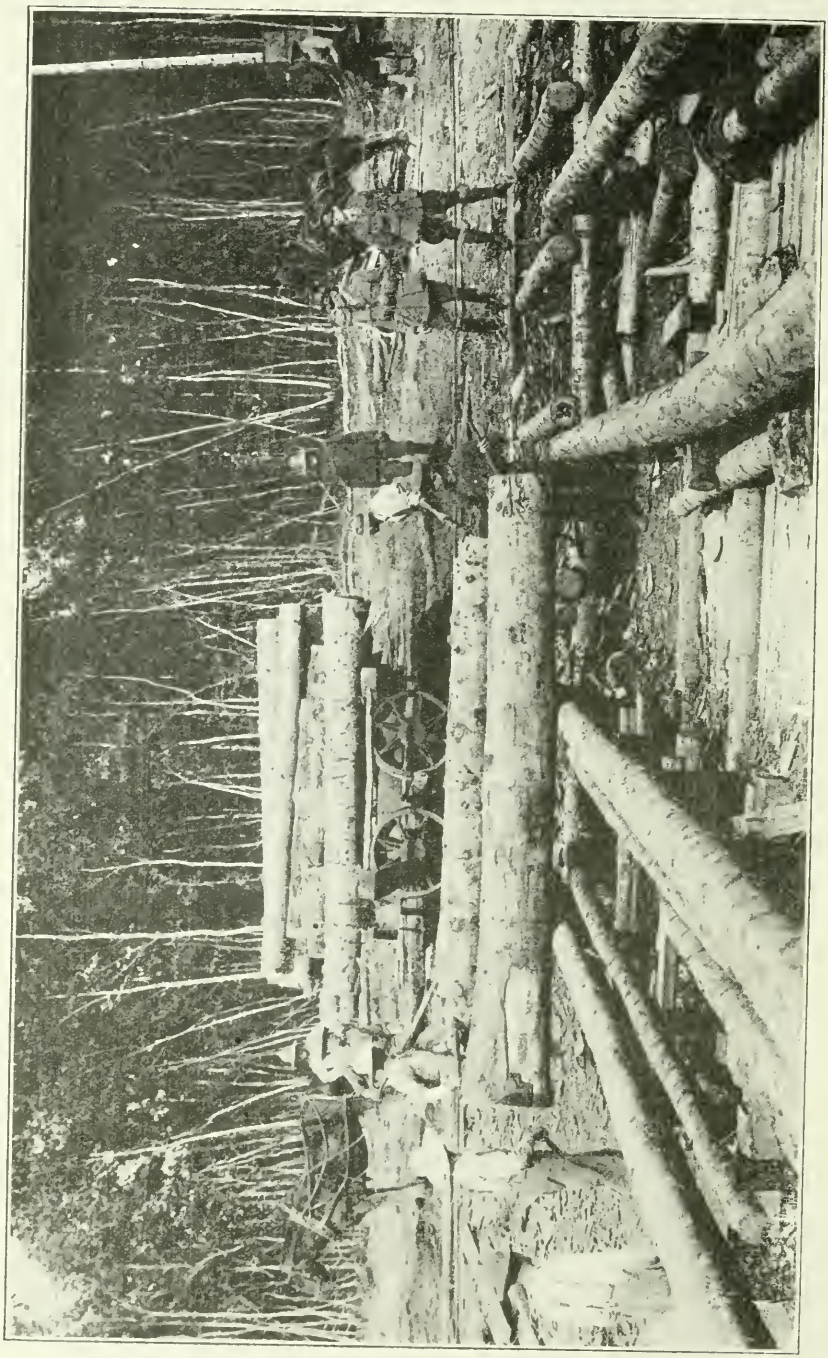

LUMBERING OPERATIONS WITH THE BRITISH ARMY (*Courtesy of American Forestry*)

In this picture is shown some of the work of the Canadian Forest section on the western front. The men are engaged in bringing in the timber from the forests, ready for sawmill operations. The character of the logs shows the care exercised by the foresters in making selections, while the trees in the background show possibilties for the future of French forestry.

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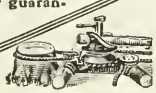

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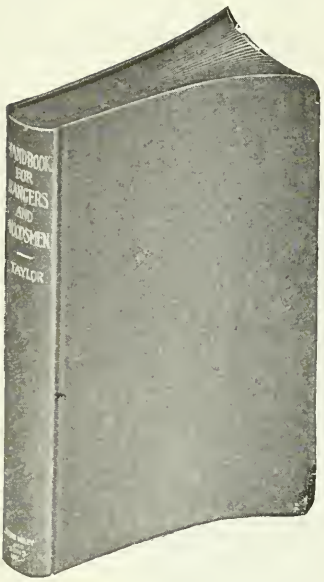


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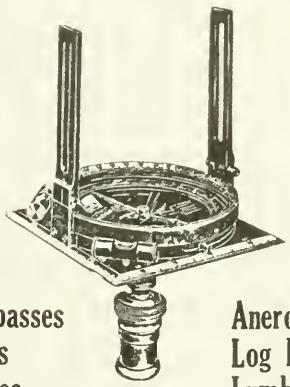

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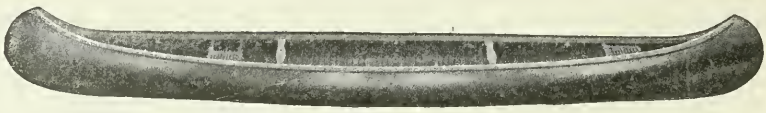

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